

Canadian Journal of **PUBLIC HEALTH**

Revue canadienne d'Hygiène publique

Volume 52

JUNE 1961

Number 6

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OF MICHIGAN

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YESTERDAY, TODAY, AND TOMORROW IN PUBLIC HEALTH**

Malcolm R. Bow



Published Monthly by the
CANADIAN PUBLIC HEALTH ASSOCIATION
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Canadian Journal of **PUBLIC HEALTH**

VOLUME 52

JUNE 1961

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The Institute of Research in Industrial Hygiene and in Air Pollution of the University of Montreal

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THIS Institute was established in May 1960 and was approved by the Quebec Ministry of Health under a federal-provincial agreement. By virtue of this agreement funds were provided by the Department of National Health and Welfare in order to initiate the project.

Following extensive discussions between the authors in regard to the need for a comprehensive university research and teaching program in occupational health, a survey financed under the National Health Grants was carried out in several countries where there are a number of institutes of occupational health and of research toxicological laboratories some of them particularly in the problem of insecticides. This survey has shown that an impressive amount of research is being carried out in all of the seven countries visited on problems of industrial toxicology and of occupational health.

Among the institutes visited were the Karolinska Institute in Stockholm, Sweden, and the Institute of Occupational Health in Helsinki, Finland. These institutes are both self-contained units. They both bring together under the same roof all the specialties, medical and technical, interested in occupational health thereby making it possible to establish good co-ordination in research and real teamwork. The budget of the Institute of Occupational Health in Helsinki amounts to some \$600,000. The Institute serves the whole of Finland which has a population of about 7,000,000.

The Province of Quebec is becoming rapidly industrialized. From being two-thirds rural some fifteen years ago, its population has become two-thirds urban. Such a situation necessitates an adaptation of the working population to indus-

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trial life, gives rise to public health problems and to problems of industrial medicine which directly or indirectly are related to industrial production. It indicates the importance and the necessity of applied research in these domains in the interest of the workers and of industry itself.

The plan of the proposed Institute covers a 7- to 10-year period which is to be approached in two stages. The first stage provides for a three-year period of development of industrial hygiene and air pollution research projects in the Institute itself and in existing special departments of the University. This stage would be supported with the assistance of a group of consultants attached to the Institute. The directorial and consulting staff would maintain contact with the projects providing public health orientation as required and would initiate, co-ordinate and evaluate research projects.

The Institute would also aid in establishing contacts with industrial organizations and fund-granting agencies and otherwise assist the participating university departments, some of which would be carrying research under a contractual agreement with the Institute.

A number of distinguished consultants have lent their services in organizing the program: Dr. Lucien Dautrebande, Professor at the University of Liege, internationally known for his work in pulmonary physiology, Dr. Enrico C. Vigliani, Director of the Clinica Del Lavoro "Luigi Devoto", Milan, Via S., Barnaba., Dr. N. V. Hendricks of the Esso Research and Engineering Company, Linden, N.J., Mr. H. Rozovsky, B.Sc., P.Eng. of Toronto, Dr. D. D. Irish of the Dow Chemical Company, Midland, Michigan, Dr. Eugene Doroschuk, Physical Fitness Laboratory, University of Illinois.

The first stage is now operating. A grant in aid has been received from the Department of National Health and Welfare through the Quebec Ministry of Health made to the University of Montreal. The International Chemical Workers Union has also made a grant for research. The Esso Research and Engineering Corporation contributed the services of senior engineer associate, Dr. N. V. Hendricks, as consultant. There was during the fiscal year 1959-1960 a grant to the Department of Physiology of the University of Montreal to cover a study on the pneumoconstriction effect of dust and on the pneumodilatation effect of certain aerosols on the lungs; another grant was made to the Department of Experimental Medicine and Surgery of the University to assist in a study of the mechanism of penetration of toxic substances through the skin. These projects were initiated by the Institute and are considered extra-mural projects. A grant was made to the Institute itself to study the insecticide problem in relation to health in the Province of Quebec; this project is considered an intra-mural project.

The second stage of the development of the Institute covering a period of 4 to 7 years would involve the provision of specialized personnel, laboratory space and equipment so that research projects and teaching could be initiated and concentrated in the Institute where a congregation of specialists would permit a team approach to many important industrial health and air pollution problems. Whether facilities existing in other university departments should be established would be considered in each case with the aid of the views of the consultants and the advisory committee.

To implement the first stage of the plan, it is estimated that further research funds of about \$50,000 per annum should be secured to cover projects in dermatology, psychological and physiological hygiene, in ophthalmology and otology, in chemistry and physics and in industrial engineering. Salaries of key staff should be provided. This staff includes the Director who is also Professor of Industrial Health and Air Pollution, an Assistant-Director who has been named Associate-Professor of Industrial Hygiene, a Senior Consultant on a part-time honorary basis, consultants in toxicology, dermatology, physiological hygiene, ophthalmology and otology, in psychological hygiene, chemistry, physics, and consultants in industrial engineering, all part-time. It is proposed that the foregoing be budgeted at \$35,000 per annum, including cost of operations.

For the 4 to 7 years of the second stage, laboratory research in the Institute may be found desirable. As a preliminary to this stage of development, it would be necessary for the University to make available adequate floor space with laboratory facilities. The first stage period would provide three years for the University to prepare such arrangements. Accordingly, soon after formal acceptance of the plan, organizational staff and consultants met with the University authorities to arrive at an outline of fields to be entered into during the second stage.

It is estimated that the budget in the succeeding years would advance to \$75,000 per annum for organizational staff, special research staff, equipment and other operational costs. During the final years of the period some decline in basic equipment costs and an increase in research staff could be expected with a final institute budget of \$100,000 per year exclusive of extra-mural research grants.

The program of the Institute will cover research and teaching, the latter directed toward undergraduates as well as graduates in science, medicine, nursing, engineering and chemistry to whatever extent would be appropriate.

The teaching program will be made a subject of special study by organizational staff and consultants in collaboration with University authorities, the Industrial Medical Association of the Province of Quebec, as well as with scientific and engineering associations of the Province of Quebec.

With respect to research, extra-mural projects already in operation have been mentioned in this outline as well as an intra-mural project covering the insecticide problem in the Province of Quebec. The program of research which the Institute has in mind for the fiscal year 1961-62 is as follows:

- (a) A study involving physical fitness measurements in relation to occupation;
- (b) A study of the tracing of nuclear aerosol material in tissues;
- (c) A study of a type of filter which would be self-cleaning using an ultrasonic device: such a type of filter could be used by industry and hospitals;
- (d) A study covering the effects of irradiation on resistance against infections;
- (e) A study covering the incidence of emphysema and chronic bronchitis in a sizable group of workers exposed to dusts or gases or both.

Some of these projects are intra-mural and others extra-mural.

The project dealing with a study of the insecticides problem in the Province

of Quebec is presently under way. This study will deal with health problems related to the production, the preparation and the utilization of insecticides, herbicides, fungicides, etc., and to the protective equipment used in the spraying of these products. An epidemiological study will also be undertaken in order to determine the frequency of diseases arising from the manufacturing, formulating and the utilization in the field of these products; an effort will be made to detect any possible chronic effects which could be attributed to the handling of these products or the ingredients which enter into their composition.

It is believed that the methods used in handling these products are sufficiently diversified in the Province of Quebec to permit the establishment of a method which could be used as a model in subsequent toxicological studies. A study of the existing methods used for the determination of the concentrations of insecticides in the air or in the biological products will be carried out with a view to improving them if possible. An effort will also be made to find a practical, rapid, field clinical method of analysis in order to detect clinical abnormalities among exposed workers.

The Institute has now at its disposal an expert in physiology of work. A project for a study involving physical measurements in relation to a specific occupation has been prepared. Negotiations have been initiated with a company in order to arrange such a study. This field of physical assessment has been sorely neglected in the past.

Not long ago, His Royal Highness, the Duke of Edinburgh, who has shown a deep interest in social problems related to industry, appeared to be surprised by the great proportion of adults in Canada who were suffering from physical defects. Such a reaction gave food for thought. It has been stated that "basic good health implies a fitness of the individual characterized by freedom from disease, enough strength, agility, endurance and skill to meet the demands of daily living, reserves sufficient to withstand ordinary stresses without strain, mental and emotional adjustments appropriate to the maturity of the individual."

Physical suitability for work is one element of total suitability and a very neglected one. This field of activities of the Institute will be related to the application of physical research to industrial hygiene. Such studies will permit the analysis of the various factors influencing work performance together with various aspects of human engineering. Business executives, airplane pilots, railway engineers, factory workers and others can be studied. Investigations in relation to human engineering, to accident proneness, to the influence of body type on physical and mental performance, etc., will be undertaken. This will include the aspect of aging in relation to work performance. It is known already that learning through experience may permit an older worker a higher degree of work performance than that of a less experienced younger worker. These studies of course would be carried out by a team including physicians, physiologists, cardiologists and other specialists.

Recently the Health League of Canada and a group of industrial physicians asked the University of Montreal to organize a seminar to discuss the question of immunization against respiratory diseases in industry; this seminar was held under the auspices of the Institute.

The Institute intends to organize an advisory committee composed in part of

representatives of industry. This committee would assist the Institute on the policy which should be adopted in regard to external relations; it would assist the Institute in the orientation of certain procedures so as to be of greatest service and benefit to industry itself. Another very important help which this committee could give is in communicating with and securing support from major companies and industries which the Institute would like to contact.

The Institute will therefore have a section composed of the Advisory Committee and of the Institute's Consultants; a section which will deal with the administration of research grants and related developments, including field operations; a section on toxicology and dermatology; a section on physiological and psychological hygiene; a section on ophthalmology and otology; a section on industrial hygiene engineering, and a section on chemistry and physics.

The aim of the Institute, as we have seen, is not only to carry out long term research but also to serve as a spearhead for the teaching of industrial hygiene. It is known that the shortage of trained personnel, medical and technical, in the sphere of industrial hygiene presents an acute problem.

The Institute will permit the approach in a co-ordinated way and through team-work of the various problems of industrial hygiene and of air pollution which require thorough investigation; it will provide to various governmental departments such as the Department of Health, the Department of Labour, the Quebec Industrial Accident Commission, the Department of Agriculture, the Department of Industry and Commerce and the Department of Mines, scientific information and, when the occasion permits, a solution to their problems in matters related directly or indirectly to occupational health.

Although the Institute forms part of the School of Hygiene like any other departments in the various faculties of the University and, as such, its budget must pass through the Board of Studies and the Board of Governors for approval, nevertheless it has been guaranteed autonomy in matters related to the initiation, evaluation, orientation, co-ordination of research projects and in the selection of qualified personnel.

The Institute is greatly indebted to the Quebec Ministry of Health, to the Department of National Health and Welfare and to the University of Montreal for their wholehearted support which has made possible its organization. Office, laboratory and library space has been provided by the University of Montreal. All this has permitted the Institute to become an operating agency which it is hoped will play an important part as a scientific and teaching center in industrial hygiene and occupational health.

The Effects of Cobalt 60 Radiation on *Trichinella spiralis* in Meat

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K. F. MACQUEEN,² B.Sc., M.A., and J. W. PULLIN,¹ D.V.M.

TRICHINOSIS in pigs in Canada has never been considered to be a serious problem. From time to time, however, infection has been reported in certain areas (4, 5, 6, 9, 14). From investigations that have been made (13, 14) it appears that where infection is a problem it is directly traceable to the feeding of garbage and usually associated with appreciable numbers of infected rats on the premises. Fortunately, all collected garbage has to be cooked to meet the requirements of the Animal Contagious Diseases Act. However, in instances where the garbage originates on the premises and is fed on the same premises this rule does not apply and this represents a possible source for the maintenance of infections. The role of rats in the transmission of the disease has not been satisfactorily elucidated. Robinson and Olsen (15) have shown that the faeces of rats that eat trichinous meat contain infective larvae, which are a source of infection to swine or any other animal that ingests them. Many adversities may figure in the completion of such infection, however, the fact remains that they do occur.

The detection of *Trichinella spiralis* in pork, while comparatively simple, is time-consuming. If a quick simple method could be devised to render all pork safe for human consumption it would be distinctly advantageous.

It has been shown by a number of workers that both X-rays and gamma rays act upon trichina larvae in meat causing death or inhibition of development. Much of the early work on the effects of irradiation from different sources and of different types on trichina larvae has been reviewed by Alicata (1). Alicata and Burr (2) using Cobalt 60 showed that from 60 to 100% of adult trichinae failed to produce fully developed embryos in experimental animals after the exposure of trichinous meat to approximately 12,000 rad. More recently, work by Gomberg and Gould (1) and Taylor (18) has further borne out the observation that irradiation of trichina larvae in meat with gamma rays is harmful to the larvae in proportion to the irradiation dosage. Irradiation also causes an inhibition of the reproductive ability of any adults developing from larvae that survive irradiation.

It was with these findings in mind that a project to study further the effects of gamma irradiation on trichina infected meat with a view to control was initiated. The experiment was designed to show the effects of various levels

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of irradiation on the survival of trichinae in meat and on the reproductive potential of the survivors. In addition it was thought that it would be of value to determine whether the level of larval infection present in the meat or whether the type of meat containing the larvae would in any way influence the effect of the irradiation on the larvae.

Method

Two groups of rats were infected with *T. spiralis* larvae obtained by digestion of infected meat with artificial gastric juice. One group received 11 times the dosage that the other group received. Two pigs about 12 weeks old were similarly infected with *T. spiralis* larvae so that one pig received 11 times the dosage of larvae that the other pig received. At the end of six weeks the rats and pigs were killed. The rats were skinned, eviscerated, and the muscles separated from the bones. The pigs were killed and portions of the gluteus, infraspinatus, psoas, masseter, tongue and diaphragm were taken. The muscle tissue was ground in a meat grinder and thoroughly mixed to ensure homogeneity. Seven gram portions of meat were placed in 21×75 mm. screw cap vials. Six vials (42 gms.) of meat were used for each treatment. The vials of meat were stored overnight in a refrigerator and irradiated the next day to the following dose levels: 6,000, 9,000, 12,000, 15,000, 18,000, 20,000 and 30,000 rad. Control batches of meat were given similar treatment except for irradiation.

The irradiations were performed in a self-contained, 15,000 curie Cobalt 60 irradiator, the Gammacell 220.¹ The source is arranged in the form of a cylindrical "squirrel cage" which surrounds the irradiation chamber giving a high degree of dose uniformity within the irradiation volume. The dimensions of the source are 8 in. diameter \times 8 in. height and of the irradiation chamber are 6 in. diameter \times 8 in. height. During irradiation, the vials were contained in a special aluminum rack which permitted the treatment of up to 24 samples during a single exposure. Since each of the 24 positions in the rack was equidistant from the source, the dose rate in each vial was the same. The doses delivered to the samples were changed by adjusting the exposure time, using a built-in automatic timer. The average dose rate during irradiation was 1.35×10^6 rad./hr. and was measured using the ferrous-ferric dosimetry system. The maximum variation in dose with a vial was estimated to be $\pm 5\%$.

After irradiation the samples for individual treatments were pooled and digested for 18 hours in artificial gastric juice at 37° C. The larvae obtained by sedimentation in a Baermann apparatus were washed in saline and counted and the number of larvae per gram of meat was determined. A group of four rats was used for each treatment, each rat being given an estimated 1,000 larvae.

At the end of six days two rats in each group were killed. The small intestine was removed, opened with scissors and placed in warm saline in a strainer (mesh, 8 to the inch) in a Baermann apparatus. At the end of four hours at 37° C. the adult trichinae were collected and counted. These worms were then fixed in

¹The irradiation facility is operated by the Commercial Products Division, Atomic Energy of Canada Ltd., in Ottawa.

5% formalin and later the females were cleared in lactophenol, measured and examined for the presence of larvae in the uteri.

After 30 days the remaining two rats in each group were killed, skinned, eviscerated, and ground in a meat grinder. The meat was artificially digested for 18 hours, the larvae collected as before, described and counted. This latter procedure served as a check on the effects of irradiation on the reproductive potential of the irradiated larvae.

All counting was done, in duplicate, by taking an aliquot consisting of one-fortieth of a suspension of the larvae. Close agreement in counts was obtained by this method.

The maturation inhibition index of the adult trichinae obtained after six days was obtained by the following formula:

$$\text{Maturation inhibition index ("r" irradiation level)} = \frac{\text{No. adults (control larvae)} - \text{No. adults ("r" irradiated larvae)}}{\text{No. adults (control larvae)}} \times 100$$

The dosage-maturation inhibition index curve was obtained using the method of Probit analysis, according to Finney (7). Analysis of variance according to the method of Snedecor (17) was used for determining significant differences within trials and between trials.

Results

It was observed that all larvae given to the control rats did not mature to adults. The highest recovery of adults for larvae given was 599 adults for 1,000 larvae, or 59.9%. This value compares favourably with that of Alicata (1) who obtained an average of 55.0%. It was also found in a preliminary trial that the number of larvae given did not appear to affect the percentage recovery of adults. Two rats given 4,000 larvae each showed a recovery percentage of 49% and 44% respectively for an average recovery percentage of 47, while two rats given 1,000 larvae each showed a recovery percentage of 60% and 40% respectively for an average recovery percentage of 50.

(1) IRRADIATION OF PORK CONTAINING 1000 LARVAE PER GM.

The results of this series of irradiation are shown in Table I and plotted graphically in Fig. I. Increase in irradiation resulted in a progressive decrease in the numbers of larvae maturing to adults, at 18,000 rad. a maturation inhibition index of 98.9% was observed and at 20,000 and 30,000 rad. inhibition of maturation was complete. The theoretical curve obtained for this type of data is usually sigmoid. In this case, unfortunately, the dosage levels were not low enough to give much information on the effects of the rays below the Mortality Inhibition Dose 50 (M.I.D. 50).

The regression line of the dosage-maturation inhibition data was calculated using the method of Probit analysis. The equation of this line is $y = 2.2 + 3.7x$. By calculation the M.I.D. 50 was found to be 5,715 rad. and the M.I.D. 90 to be 12,680 rad. The plot of this curve is shown in Fig. III.

Of special interest was the marked effect of irradiation on the reproductive potential of the adult worms developing from the irradiated larvae. At 6,000 rad. there was a marked reduction in the number of larvae produced per adult

present in the gut when compared with those for the controls; 331 larvae per adult for the controls as compared with 41 larvae per adult for the larvae exposed to 6,000 rad. From 9,000 rad. and upwards no larvae were recovered from the muscles of rats killed 30 days after infection.

Estimations were made of the percentage of adult females containing larvae at the various irradiation levels. There was a marked reduction in the percentage of females containing larvae as the dosage was increased. Even though no larvae were found encysted in the muscles at exposures of 9,000 rad. and higher, larvae were present in some of the adult females treated with the higher doses. It was noticed, however, that the numbers of larvae present in these females were much less than those in the control females. Presumably the larvae produced by these females were weak and unable to invade the tissues of the host.

TABLE I—RESULTS OF GAMMA IRRADIATION OF *T. SPIRALIS* LARVAE CONTAINED IN PORK

Larval level in meat	Irradiation dose (Krad.)	Larval dose per rat	² Av. No. adult trichinae recovered from intestine 6 days after infection	¹ Maturation inhibition index (adults)	Per cent adult with larvae	Av. length (mm.) adult females	³ Av. No. of encysted larvae per rat 30 days after infection	No. of encysted larvae per adult worm
1,000 per gm.	0	1,000	378	0	100(40) ²	2.38(10) ²	125	331
	6	1,000	170	55.0	98(36)	2.11(10)	7	41
	9	1,000	81	78.6	4(20)	1.69(10)	0	—
	12	1,000	65	82.8	0(21)	1.62(10)	0	—
	15	1,000	20	94.7	0(28)	1.31(10)	0	—
	18	1,000	4	98.9	0(1)	1.50(1)	0	—
	20	1,000	0	100.0	—	—	0	—
11,000 per gm.	30	1,000	0	—	—	—	0	—
	0	1,000	400	0	100(35) ²	2.38(10) ²	120	300
	6	1,000	143	64.3	96(25)	2.37(10)	7	49
	12	1,000	60	85.0	40(20)	2.04(10)	0	—
	18	1,000	1	99.8	—	1.07(2)	0	—

¹Maturation inhibition index = $\frac{\text{adults (control)} - \text{adults (recovered)}}{\text{adults (control)}} \times 100$

²() No. of females examined.

³Av. No. from 2 rats.

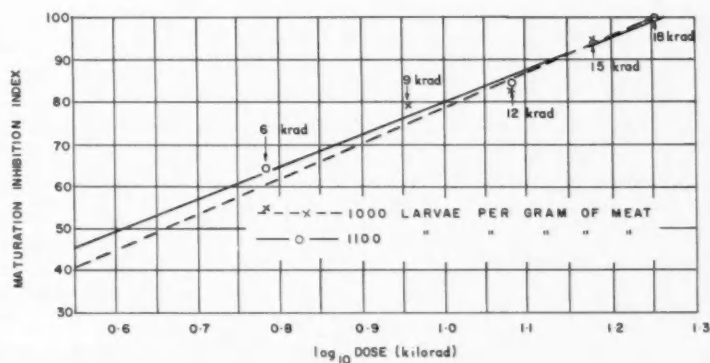


FIG. 1. The inhibition of maturation by Co^{60} gamma irradiation on *T. spiralis* larvae in pork.

(2) IRRADIATION OF PORK CONTAINING 11,000 LARVAE PER GM.

The results of this trial are shown in Table I and plotted graphically in Fig. 1.

The results obtained were very similar to those obtained for the previous trial. As irradiation was increased there was a progressive decrease in the number of larvae maturing to adults. At 18,000 rad. there was almost complete inhibition of maturation of the larvae and only one adult worm was obtained from the intestine.

Irradiation appeared to exert an inhibitory effect on the reproductive potential of surviving larvae. A dose of 6,000 rad. produced marked reduction in the numbers of larvae per adult worm encysting in muscle when compared with the controls, only 49 larvae per adult as compared to 300 per adult for the controls. At 12,000 rad. there was no recovery of larvae from the muscles of rats infected 30 days previously. Examination of the results of the percent of females showing larvae further emphasized the observation that increased irradiation adversely affects the production of larvae by the females.

The meat used in this trial contained 11 times the number of larvae that were present in the meat used in the previous trial. Analysis of variance of the results obtained for the two trials showed that there was no significant difference between the results obtained for the two levels of larval dosage.

(3) IRRADIATION OF RAT MEAT INFECTED WITH 200 LARVAE PER GM. OF MEAT

The results of this trial are shown in Table II and plotted graphically in Figure II.

The results were similar to those obtained with pork. The maturation-inhibition index for the adults rose with increase in irradiation dosage so that at 18,000 rad. there appeared to be almost complete inhibition with an index of 99.8%. A dose of 6,000 rad. appeared to result in marked depression of the reproductive potential of the larvae; 52 larvae were obtained per adult at this level of radiation as compared to 284 larvae per adult in the controls. The percentage of sterile females was also much higher as the dosage was increased.

(4) IRRADIATION OF RAT MEAT INFECTED WITH 2200 LARVAE PER GM.

The results of this trial are shown in Table II and plotted graphically in Fig. II.

These results are remarkably similar to those obtained in the other trials. At 6,000 rad. there was some lethal effect (Maturation-inhibition Index = 68.02) and marked inhibition of the reproductive ability of the survivors; 57 larvae per adult was observed as compared to 226 per adult for the controls. The 12,000 rad. treatment appeared to result in inhibition of the reproductive potential of the larvae to such an extent that even though 23% of the females examined showed a few larvae these were apparently not vigorous enough to establish an infection.

The meat used in this trial contained 11 times the number of larvae that were present in the meat used in the previous trial. Analysis of variance of the results obtained for these two trials showed that there was no significant difference between the results obtained for the two larval levels.

Analysis of variance of the results obtained for the two types of meat showed that there was no significant difference between them. In other words the effect of the irradiation was not influenced by the type of meat used.

TABLE II—RESULTS OF GAMMA IRRADIATION OF *T. SPIRALIS* LARVAE CONTAINED IN RAT MEAT

Larval level in meat	Irradiation dose (Krad.)	Larval dose per rat	² Av. No. adult trichinae recovered from intestine 6 days after infection	¹ Maturation inhibition index (adults)	Per cent adult with larvae	Av. length (mm.) adult females	³ Av. No. of encysted larvae per rat 30 days after infection	No. of encysted larvae per adult worm
200 per gm.	0	1,000	395	0	100(25) ²	2.11(10) ²	112	284
	6	1,000	134	66.1	100(32)	2.26(10)	7	52
	12	1,000	72	81.7	23(13)	2.01(10)	0	—
	18	1,000	16	95.9	0(2)	—	0	—
2,200 per gm.	0	1,000	497	0	100(45)	2.43(10) ²	112	226
	6	1,000	159	68.0	66(33)	1.78(10)	9	57
	12	1,000	101	79.6	34(41)	1.66(10)	0	—
	18	1,000	1	99.8	0(0)	—	0	—

¹Maturation inhibition index = $\frac{\text{adults (control)} - \text{adults (recovered)}}{\text{adults (control)}} \times 100$.

²() No. of females examined.

³Av. No. from 2 rats.

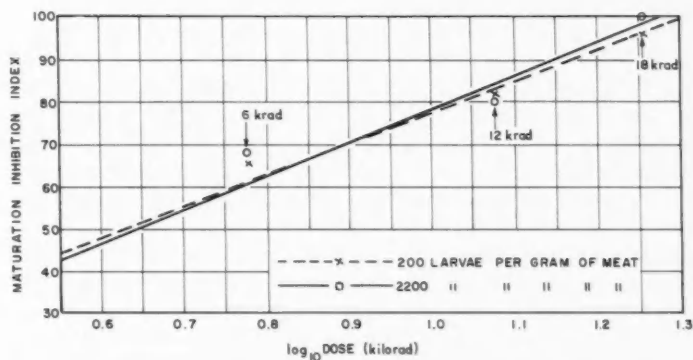


FIG. II. The inhibition of maturation by Co^{60} gamma irradiation on *T. spiralis* larvae in rat meat.

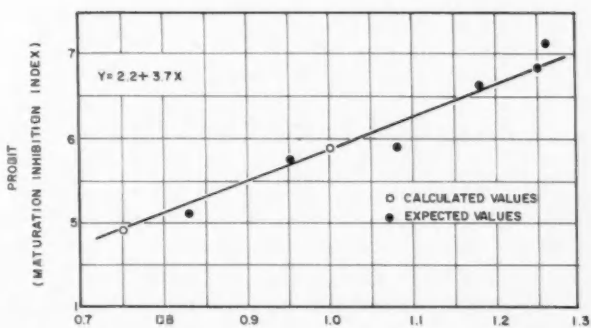


FIG. III. \log_{10} Dose of gamma irradiation plotted against probits of maturation-inhibition index for adult trichinae, in pork containing 1,000 larvae per gram, showing calculated regression line and its equation.

Discussion

The curves obtained for the numbers of larvae maturing to adults following irradiation at the various levels appear to be exponential. According to Lea (12) this type of reaction is typical of that seen with many organisms when they are subjected to irradiation. Apart from the inhibition of maturation by radiation on some of the larvae, those that matured to adults showed definite signs of damage. They were smaller than those developing from the controls. Forty female adults from larvae exposed to 12,000 rad. averaged 1.82 mm. long compared with an average of 2.32 mm. for 40 females from the control larvae (Table III, Fig. IV).

TABLE III—THE EFFECT OF IRRADIATION ON LENGTH AND FERTILITY OF ADULT FEMALE *T. SPIRALIS*

Irradiation level (Krad.)	Av. % females non-fertile	No. examined	Av. length females (mm.)	No. measured
0	0	145	2.32	40
6	10	126	2.13	40
9	96	19	1.69	10
12	76	95	1.83	40
15	100	28	1.31	10
18	100	3	1.28	3

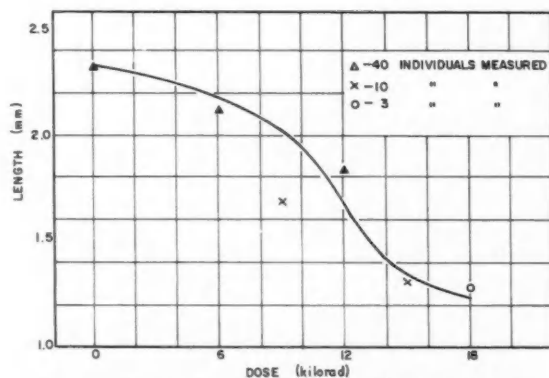


FIG. IV THE INHIBITION OF GROWTH BY Co^{60} GAMMA IRRADIATION ON THE ADULT FEMALE *T. SPIRALIS* WHICH MATURE FROM IRRADIATED LARVAE

FIG. IV. The inhibition of growth by Co^{60} gamma irradiation on the adult female *T. spiralis* which mature from irradiated larvae.

The observations of Schwartz (16) and Alicata (1) were borne out that radiation appeared to be very destructive to the gonads of these worms. The ovary of the exposed females showed shrinkage, malformation and reduction in numbers of fully developed embryos. With increased exposure the cuticle of the parasites showed wrinkling and areas of thickening, which resulted in their presenting an irregular appearance.

The results obtained compared very favourably with those of other workers who have studied the effects of irradiation on trichinae. Gomberg and Gould

(10) found that a dose of 12,000 rad. resulted in over 99% of female trichinae being sterile, 15,000 rad. resulted in complete sterilization, while 18,000 rad. resulted in reduction of maturation to less than 1%.

At 9,000 rad. inhibition of maturation, while not complete, is appreciable. More important, it appears that exposure to this level of irradiation results in inhibition of the reproductive potential of the larvae to such an extent that even though there is some reproduction by adults maturing from these larvae, the offspring produced are unable to invade the tissues of the host. Since the pathology produced by the adults in the gut is comparatively mild, usually a transient diarrhoea unless they are present in excessive numbers, it would seem that exposure of meat to levels of gamma irradiation as low as 9,000 rad. would be effective in controlling trichinosis. However, to err on the side of safety, higher levels would seem to be indicated for any practical control procedure. It might be advantageous that the larvae are not killed. Live attenuated larvae might provoke an immune reaction in the host which would be of value against future infections.

Cobalt-60 gamma radiation is far more penetrating than machine accelerated electron radiation of similar energy, and this assures uniformity of dose through appreciable thicknesses of meat. It therefore appears as if it would be feasible to irradiate sides of pork with gamma rays in a continuous system if such was designed. Undesirable flavour changes have been shown to occur in many foods when sterilizing doses of irradiation (about 2×10^6 rad.) are applied (20). However, tests on pork irradiated with doses as high as 70,000 rad. have shown that there is negligible flavour change and it would appear that a dose as high as 75,000 rad. could be used without altering the flavour of the meat (19).

Recently in the popular press great issue was made over the possible deleterious effects irradiated foods could have on humans eating them. Extensive studies were conducted by Bubl and Butts (3) on rats fed raw pork, cooked stored pork, and other foods irradiated at 2.79 and 5.58 megarad. It was concluded that the foods studied were "wholesome" after irradiation when fed at a level of 35% of their diet. As has been stated by Kraybill (11) "there is no evidence that there is any toxicity in irradiated food for man or animals. The false conclusion that there is such evidence has arisen from misleading information published by the press relative to biological response of experimental animals fed with irradiated foods." Since excess irradiation could conceivably cause the breakdown of vitamins and other essential components in meat it would be best to keep the irradiation levels to as low a figure as possible in any practical procedure. Any procedure aimed at the complete killing of trichinae in meat would be impractical as it would require dosages of radiation in excess of 700,000 rad. (10). A dosage range of 20,000 to 30,000 rad. which is sufficiently high to cause complete inhibition of maturation of all of the larvae present in meat and yet not considered high enough to cause deleterious changes in the meat is thought to be a safe range at which to operate. The cost of radiation treatment at this range is estimated to be about 0.2 cents per lb. (8). These estimates are based on the use of Cobalt-60 to treat the production of a typical, large, packing plant which slaughters 6,000 hogs per week. The cost of treatment would therefore appear to be within the realm of economic feasibility.

Summary

Increase in the level of irradiation to which larval *T. spiralis* in meat were subjected resulted in a proportionately increased inhibitory effect on maturation, as estimated by the number developing to adults in the host.

At lower levels of irradiation (6,000–12,000 rad.) even though inhibition of maturation was not pronounced, partial or complete inhibition of the reproductive potential of adult worms developing from irradiated larvae was observed.

The numbers of larvae *in utero* in those females not rendered sterile by exposure as larvae to 9,000 and 12,000 rad. were much less than the numbers of larvae *in utero* in the control females.

The effect of irradiation on trichinae in meat was independent of the numbers of larvae present in the meat.

The type of meat in which the trichinae were contained did not influence the effects of gamma irradiation on these larvae.

Conclusions

The dosage range for satisfactory control of trichinae in meat is considered to be 20,000 to 30,000 rad. This dosage while effective in completely inhibiting maturation of trichinae is well below the level which produces deleterious changes in the meat.

The irradiation of pork with gamma rays appears to offer an effective means of control for trichinosis in humans.

ACKNOWLEDGEMENTS

The technical assistance of Mr. J. Mackie is gratefully acknowledged.

The authors also wish to thank Professor W. H. Leigh of the Department of Zoology, University of Miami, Coral Gables, Florida, who furnished us with the initial infection of *T. spiralis*, and Dr. D. G. Dale of the Department of Animal Science and Mr. G. Ozburn, Department of Entomology, Macdonald College, Quebec, for help with the statistics.

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Local Health Services: How Do We Measure Up?¹

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THERE is much concern about the relative worthwhileness of various local public health services. There is concern with the problems of efficiency, with the challenge of trying to deliver services which are both economical and effective, and with the adaptation of public health to use newer technology and to deliver services in pace with the changing demands of our times.

GENERAL PROBLEMS

1. *There is the tendency to go along doing what is comfortable, rather than trying to do what is new and experimental, even when it may carry certain insecurities.*

It is much easier, for example, for the public health nurse to spend her time making the rounds of the schools, rather than plunging into the home bedside nursing program. This is particularly true when the nurse may be a little rusty on bedside technique, and when it may be tough sledding to show the community how to use the service. It is not easy to break with tradition. But it is part of our job to stand back, examine such choices, and ask: "*Which way is best for the people?*" To cite another example: the possibility of controlling phenylketonuria, the metabolic condition which causes retardation. It is much easier for us to brush off the possibility of hunting for PKU by saying, "After all, it only involves a few children" and, "After all, it would be pure opportunism." It is much harder to try to combine short-haul opportunism with long-term statesmanship, and use something such as PKU to dramatize and help advance long-term efforts.

2. *Another concern is the pressure to bow to the expediencies of the moment rather than to do what is best for the public health.*

An example of this is the local area in which the school people insisted that public health nurses perform vision screening tests. To be fair, not only the local school people wanted this done but the nurses liked to do it, too. This assignment could be carried out by a technician with a minimum amount of training. This would save nursing time and improve efficiency. But the local health department, following past tradition, went along with the schools, rather than insisting that valuable nursing time be conserved to meet nursing needs of the community. Again "*Which way is best for the people?*"

3. *Another problem is the devotion to what might be called a "scattergun approach" which sometimes makes us try to be all things to all people at all times.*

¹Presented at the annual meeting of the Ontario Public Health Association, Toronto, Ont., Oct. 3-5, 1960.

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For instance, public health practice dictates that follow-up of a school vision screening program by the nursing staff should be used as a vehicle to do other important jobs in the home. In Michigan, however, only half of the youngsters discovered to have suspected defects in screening get in for the needed follow-up exams and corrections. We do not have enough nurses to do the "home counsellor" job. In one area, the nurses recently swallowed their pride in being home counsellors and went to work on the telephones immediately after the screening program. The result: 90% follow-up. It also turned out that the 10% who failed to respond to the phone call were the same families who apparently would benefit most from a home nursing visit. The nurses felt guilty about abandoning basic public health practice and using the telephone. But in attempting to evaluate how to get most effective service at the least expense, this looks like good public health.

4. *Next, and of extreme importance, is the need to take a close look to make sure that, not only are we doing a good program job, but that we also are doing a good job of telling about it.*

We cannot convince the world by going to the world but rather convince the world by convincing those few with power and authority. Public health is still rooted in the idea of co-operation, and this comes about only when people become personally involved. Without an understanding of personal involvement, the cigarette smoker continues his smoking, accident prevention education is meaningless, and legislative bodies fail to appropriate needed funds. Most assuredly, developing co-operation and involving people on a personal basis is not easy. We must approach our work in such a way that those whom we would convince will have about the same experience as did a blind man in the story which you may recall. He had been blind all his life. Suddenly, one autumn morning, he gained his sight. He looked up and saw the trees beginning to turn, blue sky, green lawn, impressive homes, and many people. To him, this was beautiful—a wondrous sight to behold. The commonplace in public health must be so visualized to others that it, too, will be a wonderful thing to work for, to be part of, and to support with dollars and with energy.

We need to ask ourselves: "Could a member of our local board of health get up and without any special help outline what the local health department is trying to do?" How well do various groups in the community know and support the local health department—the druggists, physicians, hospitals, teachers and others? There is a job to do, individually and collectively, to impress those in positions where public policy is decided with the opportunities for better protection of the public health. Of course, we come face to face with the apparent incompatibility of trying to conserve funds to win the blessing of our local board on the one hand and on the other, of trying to secure increased funds to move programs ahead. We can move ahead only as we work with and gain the support of citizen and other health groups.

5. *We also need to examine the kind of effort being made to glamorize public health as a career.*

Recently, a new graduate of one of our Michigan universities decided to become a sanitarian in a local health department. This young man had earned

his degree in a science field, was willing to learn, and showed all of the enthusiasm that we need on the local health firing line. But after taking a look at what the local health department offered, not only in salary but also in long term security and in opportunities to move up the ladder, he turned his back on public health and decided on a teaching career. We need people in public health who are dedicated to the cause as well as to the material rewards. It is, however, necessary to work with renewed diligence to make those rewards more commensurate with the responsibilities and to the investment the individual has made in his training.

As further illustration: nurses now often carry out their work even when it means they must partially subsidize their employer by losing on travel or by getting along on a pinchpenny salary. The willingness to make this kind of sacrifice is commendable. However, the time has come when we must, together, strive to modify the Nightingale image to match new technology and new opportunities. This can be done only as we make a conscious attempt to create a more realistic image of what it means to work in public health, what kind of decisions the public health worker must make, and the importance of those decisions in the lives of people.

We must not only talk about our concern with these problems but also develop practical ways to measure our work. In Michigan, one of the current attempts in this area dates back to a newspaper strike in Detroit, when we began to read a financial newspaper published out of state. This paper carried indices which give a general picture of the market, not precisely for each item, but a sample which shows the over-all trend. The market indices made us wonder again if it would be possible to develop some similar yardstick for public health even though we support the fine work on evaluation done by the American Public Health Association.

We wondered if it would be possible to devise a brief measurement index which would not frighten the overworked local health organization or the part-time community leader. We worked both through various specialties in the Michigan Department of Health, with local health departments in the state, and later with the informal suggestions of health officials in several other states to prepare a listing which we call "Measurable Indices for Acceptable Performance of Local Health Services". This is still in preliminary stages. It is an attempt to list what we do in terms of results which can be easily measured. It is an attempt to produce an index of major accomplishments which can be placed in the hands of local people on the premise that it would be a reasonably sound guide to the local public health program. The listing we have developed is not by any means conclusive, nor is it intended to be. There is still much work to be done on it. But we are hopeful we may end up with a workable measuring tool.

MEASURABLE INDICES FOR ACCEPTABLE PERFORMANCE OF LOCAL PUBLIC HEALTH SERVICES

(Preliminary—October 1960)

CHILD HEALTH

1. Records are kept which show tangible evidence that 75% or more of the children entering school for the first time have current immunization against each—diphtheria, pertussis, tetanus, smallpox, and poliomyelitis.

2. There is a vision program including routine screening of school age children at least five times during their school years through high school. Screening is equally spaced throughout these years. At least 75% of the children found to have vision defects or abnormalities receive adequate follow-up care.

3. There is a hearing conservation program including routine testing of school age children at least three times during the school years through junior high school. At least 85% of the children found to have hearing defects or abnormalities receive medical follow-up.

4. A topical fluoride application program is operated in each county.

5. A local crippled children's register shows the current status of children with crippling conditions and every case in the register is reviewed at least annually.

6. Each school has records to prove that each child receives a health examination to detect physical defects before entrance to school or during the period of elementary school.

COMMUNITY SANITATION

7. A county sanitation code is established and enforced.

8. The health authority acts in an advisory capacity to the county plat board on adequacy of land for platting from a public health standpoint.

9. There are regulations which are enforced controlling the installation of septic tanks and private wells.

10. Schools are inspected at least every three years with follow-up on critical problems.

11. At least 70% of the motels, resorts, and camps meet health agency minimum standards.

12. There are no unlicensed trailer coach parks in operation. Reports on file represent actual conditions in the parks.

13. There are regulations which are enforced governing the operation of food-handling establishments.

14. A food-handler education program is conducted for operators and owners.

15. The milk sanitation program meets the standards for certification established by the Michigan Department of Health.

TUBERCULOSIS

16. At least 95% of all persons found to have suspected tuberculosis through mobile chest X-ray survey receive follow-up within three months.

17. At least 50% of all persons admitted to general hospitals excluding newborn, pediatric or emergency admission receive a chest X-ray on admission.

18. At least 95% of the contacts of tuberculin positive children receive follow-up examination.

19. 85% of the contacts (those persons in a situation where relationships are similar to that of a family) of persons newly reported to have "active" or "probably active" tuberculosis are examined within 60 days after the case is reported.

20. A local tuberculosis register shows current status of all persons with tuberculosis. Every case in the register is reviewed at least annually.

21. All persons with newly reported active tuberculosis are placed under public health supervision within one week of the time reported.

22. 90% of all persons newly reported to have active tuberculosis are hospitalized within 30 days of the time reported.

23. 90% of persons discharged from tuberculosis sanatoriums are visited at home by a health agency representative within one week following discharge, and visited at least every three months thereafter for a minimum of two years.

24. All persons with active pulmonary tuberculosis at home are under public health supervision and a contact is made by the public health agency at least every month.

OTHER COMMUNICABLE DISEASES

25. All communicable diseases where the epidemiological pattern is not clearly established are reported. These are:

Hepatitis—I.H. & S.H.

The encephalitides

Leptospirosis

Ornithosis

Staphylococcal infections

Salmonellosis

Shigellosis

Amebiasis

Poliomyelitis

Brucellosis

26. A medical epidemiological study is made of every reported incident of food-borne disease involving more than a single family situation and of every reported case of diphtheria, brucellosis, salmonellosis, shigellosis, amebiasis and poliomyelitis.

27. 75% of all named resident contacts of cases of early syphilis are found and 95% of those found are examined and placed under treatment if indicated.

28. 75% of all named resident contacts of gonorrhea in males are found and 95% of those found are placed under treatment if indicated.

29. Each hospital has a committee on infections with authority both to take preventive actions and to take prompt decisive action in actual or suspected instances of hospital infection.

ADULT HEALTH

30. The health authority inspects nursing homes and homes for the aged and makes recommendations to the Michigan Department of Health regarding licensure.

31. Bedside nursing service is available on an organized basis.

32. The follow-up of tuberculosis chest X-ray procedures includes the follow-up of persons found to have X-ray findings indicative of cancer or heart disease.

RECORDS AND LABORATORY

33. There are records which show that the ten leading causes of mortality are known by someone responsible for the guidance of public health services and services are provided to combat at least six of the ten leading causes.

34. Laboratory services are available to physicians so that specimens for bacteriological, serological and chemical examination are received in the laboratory within 18 hours or less of time sent from point of origin.

These questions now are being refined and reworked, and we hope to test the indices within a short time. It should be emphasized that this type of evaluation would supplement rather than replace more scholarly endeavour.

Adenovirus Infections

W. L. PARKER,¹ J. C. WILT,¹ and W. STACKIWI¹

THE Adenoviruses were first identified as a distinct biological group in 1953 (1); since that time a good deal of information has accumulated on these viruses and the infections they produce. It is the purpose of this communication to review briefly the present state of knowledge on the Adenoviruses and to report the isolations obtained in the province of Manitoba during a one-year period from April 1959 to March 1960; the symptoms of the patients will be discussed.

The Adenoviruses are made up of 26 antigenically distinct viruses; eighteen types have been isolated from human sources (2) and eight from animal sources. Five of the animal types are of simian origin (2), one of bovine (3), one of canine (4) and one of murine (5). Further work is required to confirm the inclusion in the group of the last three, but they appear to satisfy the accepted criteria. These criteria are as follows (6):

- (a) Size of infective particle varies from 80–120 millimicrons in diameter depending on the method of measurement.
- (b) They each possess a common soluble, group-specific complement-fixing antigen.
- (c) They are resistant to the action of ether.
- (d) They produce a characteristic cytopathic change in cell culture, particularly human epithelial cell lines such as human amnion and HeLa.
- (e) They are a regular icosahedron in shape.

All diseases produced by the Adenoviruses may not represent a primary infection. Following an initial exposure it has been shown that the virus may remain in an occult state (7) in a few cells of lymphoid tissue for a considerable length of time. It is therefore possible that recrudescence of upper respiratory infection may be due to the unmasking of such occult virus. Experiments with volunteers show that these viruses can be readily transmitted from person to person and their pathogenicity has been established for humans, beyond doubt (8). The accumulated reports suggest the association of Adenovirus types with the following clinical disease entities:

TABLE I—DISEASE SYNDROMES ASSOCIATED WITH ADENOVIRUSES

Type	Associated Disease
1, 2 and 5 (usually sporadic)	Non-bacterial pharyngitis commonly Conjunctivitis occasionally Usually occur in first three years of life (9)

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This study was aided by a Federal-Provincial Public Health Grant (No. 606-9-140).

TABLE I—(Continued)

Type	Associated disease
3, 4, 7 and 14 (often epidemic)	Acute respiratory disease of young adults (A.R.D.) Type 3—isolated conjunctivitis Types 3 and 7—pharyngo-conjunctival fever (6, 10) Type 7—one epidemic of diarrhoea (11)
6 and 10	Isolated conjunctivitis (12)
8	Epidemic kerato-conjunctivitis (13) (shipyard eye)
Remaining Types	Associated with no specific disease entity Often isolated fortuitously

These reports tend to divide the Adenoviruses into two broad groups on clinical grounds; types 3, 4, 7, 8, and 14 produce epidemic disease, whereas the remaining types appear to cause a sporadic form of infection. Experimental studies on tissue culture also show distinctions between the same 2 groups due to differences in their biological properties (14). Furthermore, types 1, 2, and 5 can exist in an occult form in tonsil and adenoid tissue, whereas types 3, 4, and 7 apparently do not.

This division into 2 groups by widely divergent methods does not seem fortuitous since the groups have a significantly different disease-producing potential as well. Surveys of the incidence of type-specific neutralizing antibodies in the various age groups of the population suggest that types 1 and 2 affect mainly children, usually before the first three years of life. It is said that children under the age of five show only a low incidence of neutralizing antibodies to the other types. On the other hand, adults have a high incidence of antibodies to types 1, 2, and 5, and a moderately high incidence to types 3 and 7 (14, 15). The occasional excretion of virus by individuals with a latent infection with Adenoviruses types 1, 2 and 5, may account for the widespread occurrence of antibodies to these types in all age groups of the population. The failure of types 3, 4 and 7 to remain latent may likewise explain the paucity of antibodies to these types and may provide a reason why these are the types that produce epidemics.

Materials and Methods

Specimens consisted of post-mortem material, throat swabs, throat washings, bronchial washings, rectal swabs, faeces, and acute and convalescent blood specimens. Specimens were prepared by standard methods; for isolation of virus the supernatant fluid was inoculated onto roller tubes containing monolayers of two cell culture lines. The lines used were second generation human amnion cells, and first generation monkey kidney cells. Two tubes of each cell line were used for isolation attempts. The cytopathic effects of the Adenoviruses on cell culture are quite characteristic; final identification was made by neutralization with type specific rabbit antiserum on amnion cells. The complement-fixation test was used for all serological studies. The antigen consisted of heat-inactivated, virus laden fluid obtained from the supernatant of human amnion cells superinfected with Adenovirus type 3.

CRITERIA OF INFECTION

In children particularly, inapparent and sub-clinical infections occur frequently, and mixed infections are by no means uncommon. As a consequence of this, the following classification is outlined with the knowledge that it is by no means comprehensive, but that it does cover most situations that arise in diagnostic virology.

TABLE II

GROUP 1. *Diagnostic*

The isolation of a virus from a patient in whom there exists a clinical disease usually produced by that virus, and in whom a significant specific antibody rise has been shown to occur between acute and convalescent blood samples.

GROUP 2. *Strongly Presumptive*

(a) The isolation of a virus from a patient in whom there exists a clinical picture characteristic of that virus, and in whom a high titre of specific antibodies has been shown to exist in a single convalescent blood sample.

(b) The demonstration of a significant rise in titre of antibodies against a particular virus, between acute and convalescent blood samples, occurring in a patient who exhibits a clinical picture characteristic of an infection by that virus.

(c) The isolation of a virus from an unusual body site, e.g., from the cerebral spinal fluid in cases of aseptic meningitis.

(d) The isolation of a virus from pathological tissue in which there exists an histological picture shown previously to be characteristic of an infection by that virus, e.g., inclusions in the hippocampal area of the brain in rabies.

(e) The isolation of a virus obtained from an individual exhibiting clinical signs and symptoms similar to those found in proved epidemic cases.

GROUP 3. *Highly Suggestive*

(a) The isolation of a virus from a patient who exhibits a clinical picture characteristic of that virus.

(b) The demonstration of a high antibody titre to a specific virus, in a single convalescent blood specimen obtained from a patient who exhibited a clinical picture characteristic of an infection by that particular virus.

Only cases fulfilling the requirements of at least one of the above groups are included in the results.

TABLE III—THE NUMBER OF CASES FULFILLING THE DIAGNOSTIC CRITERIA IN TABLE II

Group	No. of Cases	
1 :	9	Diagnostic
2 (b) :	11	} Strongly Presumptive
2 (d) :	4	
2 (e) :	10	
3 (a) :	19	} Highly Suggestive
3 (b) :	17	
TOTAL	70	

Results

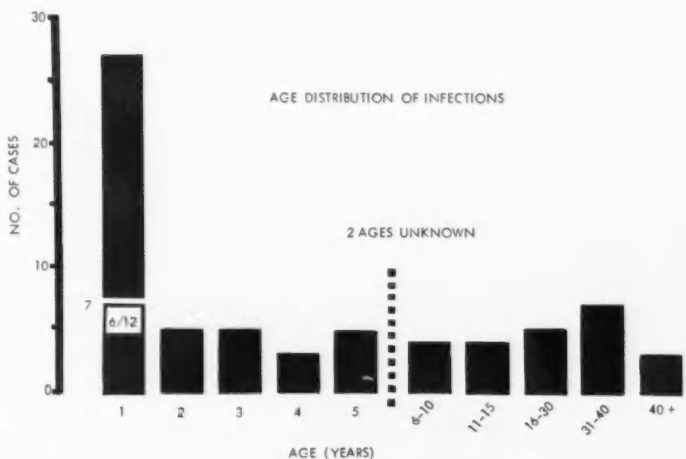
A total of 70 patients were diagnosed as having an Adenovirus infection. There were 42 isolations from these; 35 were Adenovirus type 3, 4 were Adenovirus type 2, and 3 were Adenovirus type 1. Nine of the isolations were accompanied by a two-tube (four-fold) rise in group specific complement-fixing antibodies, between the acute and convalescent blood samples.

Twenty-eight patients were diagnosed on serological evidence only. In these, antibody levels were determined by the complement-fixation method and conse-

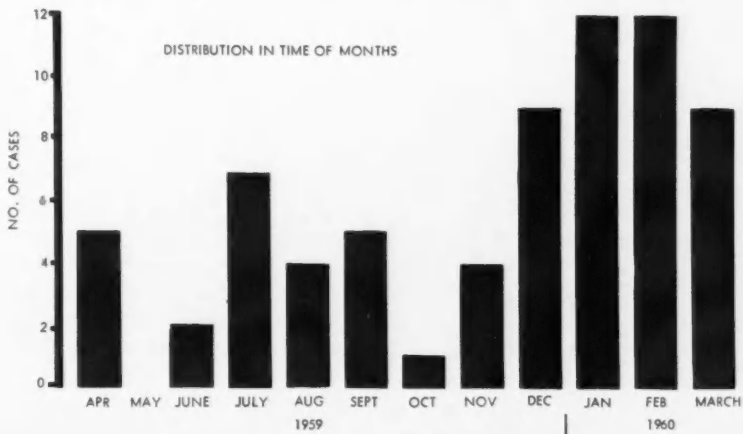
quently the specific Adenovirus type was not determined. Whenever a diagnosis was made by the presence of a characteristic clinical picture associated with a single convalescent antibody titre, the titre was considered significant only if it was at a dilution of 1:32 or higher.

Discussion

Thirty-five of the 42 isolations were type 3 Adenovirus. Twenty-five of the isolations were from children under one year of age; 20 were Adenovirus type 3. It has been considered that type 3 infections were the exception rather than the rule in very young children and that type 3 infections were most numerous in the 4-15-year age group. This is not borne out in this study. Nevertheless, it must be recognized that the specimens tested in this series do not represent



a true random sampling, and that the number of specimens received from very young children was approximately twice that of any other age group. It

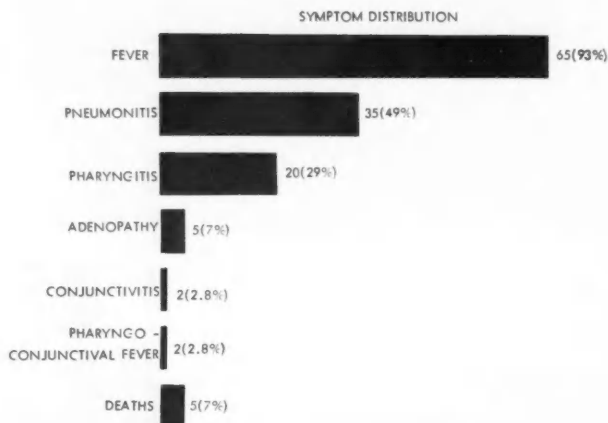


does appear, however, that the type 3 Adenovirus was responsible for more illness than any other type, in all age groups.

Adenovirus type 1 was isolated from three patients under one year of age. The virus was isolated from the lung tissue of one patient at post-mortem. This does not appear to be significant in view of the fact that adequate pathology existed in this child to otherwise account for death. The remaining two patients suffered only mild upper respiratory symptoms. Adenovirus type 2 was isolated from four patients under three years of age; all exhibited a minor upper respiratory infection with no sequelae.

The peak months of infection were December, January, February and March, but sporadic adenovirus infections occurred all year round.

Sixty-five of 70 patients had some pyrexia; temperature varied from 99–103 degrees Fahrenheit with the majority reaching 103 degrees at some time; in many the temperature was biphasic. Forty-three per cent of all patients had an acute respiratory infection. Twenty-eight per cent of all patients had a pneumonitis; this was often persistent and many showed radiological evidence of pneumonitis when all clinical symptoms had cleared. Many of these infections were prolonged and "grumbling" in nature. Only two patients had a conjunctivitis and two had pharyngo-conjunctival fever. In view of the number of isolations these latter syndromes occurred less frequently than would be expected. The illness caused by these viruses was in most instances of short duration, except for those patients with pneumonitis, in which symptoms were often prolonged and intermittent.



Some of the children in this series were admitted to hospital for a different disease and appeared to obtain their adenovirus infection while in hospital. Whether this was due to cross infection, or to the unmasking of a latent infection precipitated by some other debilitating disease or procedure is not known. Swabs were taken from the walls of the steam room into which all cases with respiratory trouble were placed for varying lengths of time; no Adenovirus isolations were obtained.

In four of the five fatal cases, Adenovirus type 3 was isolated from post-mortem lung tissue or bronchial secretions. The post-mortem lung tissue in

these cases showed a unique histological picture. This was characterized by a necrotizing bronchiolitis with intranuclear and some intracytoplasmic inclusion bodies. This picture was not seen in the one fatal case associated with Adenovirus type 1. These fatal infections will be the subject of a separate publication. This type of histological picture may be revealed more often because previously such deaths were probably complicated by bacterial infection which is now likely suppressed by antibiotic therapy. In four of the fatal cases one serum specimen or more was obtained; all showed an absence of complement-fixing antibodies to the Adenoviruses. Paper electrophoresis was carried out on the sera from these children and no obvious deficiency of gamma globulin was detected. The absence of antibodies in these patients is as yet inexplicable.

It is of interest that in the process of attempting virus isolation in parallel on two cell culture lines, e.g., monkey kidney and human amnion, it has become increasingly apparent that Adenoviruses produce a cytopathic effect on human amnion cells with ease, and on monkey kidney cells with difficulty. It is considered that for routine Adenovirus isolations a human epithelial cell line is essential.

Finally, it is our impression that the incidence of Adenovirus infections in the population at large, and particularly children, is of a sufficient magnitude to consider the more common use of a polyvalent Adenovirus vaccine (types 3, 4 and 7).

Summary

1. The biological characteristics of the Adenoviruses and the diseases they are reported to produce are briefly reviewed.
2. The number of adenovirus infections occurring in Manitoba during a one year period, and the criteria by which they were diagnosed are discussed.
3. The disease syndromes seen in these patients are discussed. Five deaths occurred; an Adenovirus type 3 was isolated from post-mortem tissue of four cases and an Adenovirus type 1 from one case. A characteristic histological picture was present in the lung tissue of those cases from which Adenovirus type 3 was isolated.
4. The significance of the clinical and laboratory findings is discussed in relation to the potential health hazards presented in the various age groups by infections with viruses of this group.

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The R. R. Parker Memorial Address, 1960¹ Yesterday, Today, and Tomorrow in Public Health

MALCOLM R. BOW,² B.A., M.D., C.M., D.P.H.

ALLOW me to say how much I appreciate the honour conferred on me in being asked to give the R. R. Parker Memorial Address on the occasion of this the fifteenth International Northwestern Conference on Diseases in Nature Communicable to Man. I recall that the first meeting of this organization was held in a school house at Waterton Lakes, Alberta on July 24, 25, and 26, 1946 with an attendance of 15. I had the honour to act as chairman of that meeting and Dr. Parker took an active part in the proceedings.

As the Director of the Rocky Mountain Laboratory of the United States Public Health Service, Dr. Parker made an outstanding contribution to our knowledge of diseases occurring in nature which are communicable to man. He was a great leader to whose vision, industry and great ability those who worked with him, those whose privilege it was to know him, and those who come after him, will always be debtors. He lives on in the work of the great research center which he and his associates at Hamilton, Montana established on a sure foundation.

My introduction to the public health field was through the public health laboratory, having spent the summer preceding graduation in medicine and one year following graduation in 1911, as assistant to the director of the Provincial Public Health Laboratory of Saskatchewan, the late Dr. G. A. Charlton. I will always be grateful for that experience.

As the first full-time medical officer of health of Regina I faced my first emergency two months after taking office in the Regina cyclone of June 30, 1912, in which some three hundred persons were injured and thirty died, in setting up and staffing six emergency hospitals with volunteer staffs. The response of the public was wonderful, as it is in all such emergencies.

Our next emergency, three months later, was a typhoid epidemic of two hundred cases. This again required the organization of emergency hospital services. Typhoid carriers and fly-borne infection from open privies were the sources of this and subsequent epidemics in 1913 and 1914. Those were the days when the public health staff was literally in the front line trenches. In order to enforce effective preventive measures, city regulations were passed under which the installation was required of sanitary U shaped containers with tight-fitting seats in properly constructed, screened, and ventilated toilets. Properly designed

¹Presented at the fifteenth International Northwestern Conference on Diseases in Nature Communicable to Man held at Banff, Alberta, August 25, 1960.

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wagons were provided by the city to convey twenty-four of these sanitary containers to a central station where they were dumped into a main line sewer and then washed and sterilized with steam under pressure. In due course, with these measures and the extension of water and sewer services, typhoid was eliminated except for sporadic cases due to carriers and one milk-borne epidemic. The stationing of a full-time public health nurse to patrol the district in which most of the typhoid cases occurred in those early years was an important step.

The next emergency we faced was the influenza epidemic of 1918 at the height of which the number of physicians in Regina was reduced from 30 to 10. Emergency hospitals were again organized and staffed by volunteers. I would like to pay tribute to the wonderful contribution made by voluntary workers in these emergencies.

Smallpox epidemics occurred from time to time. Thanks to alert and competent public health nurses and inspectors and the prompt vaccination of all contacts, such epidemics were promptly brought under control. When we think of the ravages of smallpox in the fourteenth century when not less than twenty-five million people in Europe alone were wiped out by this disease, we begin to appreciate what a gift Jenner gave to the world in vaccination. In 1796, Edward Jenner, a Gloucestershire physician, vaccinated a healthy boy about eight years old with material from a sore on the hand of a dairy maid who had contracted Cow pox. Six weeks later he inoculated this boy with smallpox matter and it failed to infect the boy. Jenner's report on this historic work was returned to him by the Royal Society and he was roundly condemned by the general public. Such was the reward one of the greatest benefactors of mankind first received from his colleagues and from the public of his day and generation. He was later honoured at home and abroad for his epoch-making discovery. Jenner said of his great discovery: "I placed it on a pedestal where I knew it would be immovable before I asked the public to take a look at it." After 164 years we still have misguided souls who refuse to take a look at it.

As you will note, the program for the prevention and control of communicable diseases and the program in the field of child hygiene aimed at reducing the high infantile death rate were the principal public health activities of those early days. There were many outstanding figures in the public health field in both Canada and the United States during this period and I regret that time will not permit mention of their names but by their works we know them.

National and international associations such as the Canadian Public Health Association, the Dominion Council of Health, the American Public Health Association and the State and Provincial Health Authorities of North America, and many others provided a clearing house for ideas and a great stimulus to those in the public health field. The International Health Division of the Rockefeller Foundation made an outstanding contribution throughout this period in making grants available for the training of public health personnel. Without the assistance extended by the Rockefeller Foundation, and in later years by other foundations, it would have been difficult if not impossible to recruit and hold competent and well trained public health personnel without which no public health program can be effective.

"The old order changeth, yielding place to new." It is only when we look back

on the developments which have taken place in public health during the last half century and particularly during the last quarter century, that we realize how far we have travelled along the public health highway. Yet, we have hardly more than started on our journey. When we consider the promise of prevention in the field of medicine and public health, we have to admit that in all too many cases it is still just a promise. Today the pound of cure still takes a predominant share of the taxpayer's dollar. The insistent demands of the public for social security, worthy though many of them are, have resulted in far too meagre appropriations for research and sound preventive programs in the public health and public welfare fields. The sad part of it is that millions of dollars now being expended for treatment services would not have been required had the real value of research and prevention been properly recognized during the last quarter-century. It is most unfortunate that this generation has failed to recognize the value of the work of our scientific leaders and to realize that a highly skilled and thoroughly trained staff is essential to do an efficient job and such a staff deserves to be properly compensated. It is heartening to note that there has been a decided improvement in attitude in recent years, but a great deal of public education remains to be done. We require a well co-ordinated, long term, soundly based, educational program in order to solve this problem.

What of the future of preventive medicine and public health? In 1913 I attended a meeting of the Regina Town Planning Commission at which a report was submitted by the president of Regina College, the late Dr. Andrews, on a town planning convention he attended in Chicago as a delegate from the local commission. In his report he said that we will soon be able to sit in our living rooms and listen to the world's great orchestras and choirs, the world's great actors and orators, and hear what is happening around the world while it's happening—thanks to radio. A minister sitting directly in front of me turned and said to me: "This man hasn't been to Chicago, he has been to Jerusalem!" Now, when we think of what radio and television have done for us, and to us, we realize that most of the errors of the past in other fields have been repeated in these marvellous new fields. This was almost bound to be the case in a field which has developed so rapidly, and which makes such a universal appeal. We should play our part as scientists in seeing that high standards are maintained in the field of radio and television which is today such an appealing and effective educational medium.

I feel that in this highly materialistic age we need to get back to a recognition of what are the real values and purposes in life. We in the scientific field need to do this as much, if not more, than others. Man does not live by bread alone. Darwin in his youth was a great lover of Shakespeare, but he became so completely engrossed in his monumental work on the origin of species that he had no time left for Shakespeare. He said that when his work was completed and he could enjoy some leisure, he would return to the study of Shakespeare's works. Alas, when that time came he found that he had lost the keen interest and enthusiasm of his youth, and could no longer enjoy Shakespeare. That is the danger which all specialists face. Hence, the vital importance of a system of education which will provide in the home, and from the time our children first enter school, through high school and university, an opportunity to acquire a

knowledge and a love of the best things that have been said and written through the ages. In this atomic age there is a sad lack of appreciation of, and hence a lack of interest in, what should be the real purpose of education, namely that it should fit us to live and to live more abundantly.

With further achievements in the field of medicine, preventive medicine, and public health to which we can look forward with confidence, the expectation of life will undoubtedly be extended by at least another five years in the next quarter-century, and considerably more than that if the all-out attack on cancer and on diseases of the heart and circulatory system proves successful. With fewer hours of work, more and more leisure and a longer life, the problem facing us is how are we to ensure that these desirable objectives work out to the benefit of the individual, and of society as a whole? This is a challenge to all of us and we must not fail to meet it. Let us say with Sir Winston Churchill, the greatest statesman of our age: "Give us the tools and we will finish the job." In my opinion, every university student, regardless of the course he takes, should receive a well-rounded course of instruction in the humanities. This is essential if our graduates are to give the leadership so urgently required in this atomic age.

During the last twenty-five years science has far outstripped the social sciences. We have still to learn how to live as the poet Robert Burns expressed it so well: "That man to man shall brithers be the whole world o'er for a' that." At the last Mount Allison University Summer Institute on Science and Society, Dr. Cyrus Ouellet of Laval University, said that a new culture based on the blending of the spirit of science and humanistic values will be a condition of survival in the atomic age. Scientists have given the lead. In no other field of endeavour has there been more international co-operation, understanding, and good will than in the scientific field. Let us do our part to see that this spirit prevails in all other fields.

**CANADIAN PUBLIC HEALTH ASSOCIATION
CONSULTANT ADVISORY SERVICE IN
PUBLIC HEALTH ADMINISTRATION**

As approved by the 50th Annual Meeting of the Association in Halifax N.S., a Consultant Advisory Service in Public Health Administration has been established with the Executive Director, Dr. E. J. Young, as the administrative officer.

The service is intended to supplement the consultant advisory services of the Federal and Provincial public health authorities and relates to situations in which the services of an independent, non-official, health consultant might be most helpful.

For additional information relating to this service please address inquiries to: Dr. E. J. Young, Executive Director, Canadian Public Health Association, 150 College Street, Toronto 5, Ont.

Canadian Journal of Public Health

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THE ANNUAL REPORT OF THE LOCAL DEPARTMENT OF HEALTH

THERE are two needs that may be met by the annual report of the medical officer of health. One is, of course, the statutory requirements of the filing with the provincial department of a report, largely statistical, of the work of the various divisions of the local department. The other is to inform the municipal council and the public of the statement of the health of the community, the accomplishments, and the work required to be done.

Reports of local departments of health in Canada are, in the majority of instances, prepared solely to fulfill the requirements of the provincial department and the local board of health. The value of the report as a means of informing and interesting the public in the work of the department is not often appreciated.

Possibly there is a lesson to be drawn from developments in industry. Those who are interested in financial investments have noted the great improvements in the annual reports of many companies, notably Canadian companies. For many years the annual reports were dull documents that gave little encouragement to the shareholder to read them, and presented little more than the financial accounting and brief statements from the responsible officers. A cover was just a cover, the typesetting and printing contributed little, and illustrations of plants and equipment, products and marketing operations were not even considered to be of interest. The preparation of a report was usually considered by management as a task that had to be done each year. Why the change? Leading companies have recognized that the shareholder can be of help to a company and that public interest is very desirable. Well informed shareholders are a great asset.

It has been realized by many companies that a wide distribution of securities to the investing public is advantageous and that an informative, attractive annual report is one of the best means of making a company known to investors and to the public in general. Annual reports of companies today represent the expenditure of much time of the senior staff, of experts in design, and the use of the best of printing skills. Companies know that annual reports are not only necessary, but pay large dividends.

What about annual reports of local health departments? If they are to be of interest to the public there must be a desire on the part of the health department that the citizens of the community should have better knowledge of its purposes and work. There must be a realization that on this better understanding depends the future of the department. Health officers often complain of the inadequacy of their departmental budget. The annual report can be a means of having more adequate support.

A report which will be read by the public requires much thought and careful planning. Its preparation becomes an "all year" project. A good report tells what the department is doing in all its fields of work. This information must be presented in an interesting way, not leaving it to the reader to glean what he can from the statistical tables. Pictures may be of great help and are worth the expenditure, which is often less than anticipated if offset printing is used. There must be an appreciation that the health department story is of greater interest and of greater importance to the public than the report of any other department of the municipality.

Throughout the years the Association has made valuable contributions to the increased effectiveness of public health programs through the work of study committees. A committee to consider the annual report of the local health department—its value, content, and distribution—might well be established and the findings presented at the annual meeting of the Association in 1962.

ANNUAL REPORT OF THE ASSOCIATION

1960-61

REPORT OF THE HONORARY SECRETARY

G. W. O. Moss, M.D., D.P.H.

THE FIFTY-FIRST annual meeting in Halifax gave further impetus to the changes decided upon by the Executive Council in preceding years. The report of the Action Committee formed to find ways and means of implementing the recommendations of the Committee on Needs of a previous year was introduced and endorsed. Foremost among the recommendations was the appointment of a full-time Executive Director. The Executive Committee in conjunction with the Action Committee took the matter in hand. Meetings were held in Toronto within a few weeks of the Halifax Executive Council meeting, and by August 1960 an appointment had been made. Dr. E. J. Young assumed the post of Executive Director on October 1, 1960. He needs no introduction in this report. Appropriate mention has been made of him in

the pages of the Journal, and by the time of the 1961 Annual Meeting he will have personally visited all of the provinces, meeting with many officers of the Provincial Associations, Branches or Divisions. It is sufficient at this point for the Honorary Secretary to acknowledge gratefully this appointment and to extend a personal note of appreciation to Dr. Young for his splendid co-operation.

With the appointment of a full-time Executive Director, the work of the Association will forge ahead with a cohesiveness not hereto possible. It must not be assumed that the Executive Director himself can carry the work of the Association. The same voluntary effort on the behalf of the members must continue. Important issues and developments face us. It is only through the support of the membership, and the productive effort of committee action that the Executive Director can fulfil his responsibilities to the Executive Council and that the work of the Association will be effectively carried on. The Association must move as a whole and not as one or more individuals. The decision has been made to retain all the Honorary Officer posts and the Executive Director can rely on their full support.

The Executive Director has a prime responsibility in the direction of the Association's new Consultant Advisory Service in Public Health Administration. A small committee has been formed to aid him in this function. He has also accepted significant responsibility in coordinating the activity of the various provincial organizations as they relate to the national office. Otherwise, the Executive Director and Honorary Secretary have shared the duties of the national office without any strict division, the Honorary Secretary devoting attention to the business of the Executive Council and Executive Committee, the Executive Director to certain committees appointed by the Association. This sharing of duties is desirable as the Executive Director may be absent from Toronto for extended periods and the Honorary Secretary frequently finds his professional obligations do not permit him to give time to certain meetings and activities.

The Executive Committee has met on a number of occasions for special reasons as discussed and for the conduct of the regular business of the Association. One significant development was the appointment of a special "ad hoc" committee to deal with the preparation of a presentation to the Royal Commission on National Health Insurance. The assistance of the Committee on Social Security, assigned to the Medical Care Section some years ago, will be required in this endeavour.

Committee activity is reported as usual in this annual statement under appropriate headings by the chairman of each. Special attention is drawn to the Committee on Membership. We can spare no effort to enrol the maximum number of public health workers in the Association. The Executive Council will have before it for consideration a draft of the new by-laws prepared by the Committee on the Charter and By-laws.

The 1960 meeting in Halifax was a profitable one from the point of view of the quality of scientific presentations, social activity, and financial gain. The members of the Nova Scotia Branch are to be highly commended on this meeting. It has been customary now for the provincial organization at the

site of the annual meeting to conduct the detailed planning for and conduct the operation of the annual meeting. This has come about by a process of evolution and the provincial organizations which hold their own annual meetings have developed increasing skills. Each year produces some innovation and the general trend has been one of improvement. With this year's annual meeting in Regina, the policy established by the Executive Council some years ago of meeting with all of the provincial organizations in rotation will have completed its first round. Plans for this year's annual meeting which have appeared in the *Journal* indicate that the Saskatchewan Branch has determined not to be outdone. Perhaps an unintentional but none the less productive rivalry has developed which, if continued in this same spirit in which it has grown, will bring forth many pleasant experiences in future years.

Future annual meetings have received their share of attention. In 1962, Toronto and the Sheraton-King Edward Hotel will be the site of the annual meeting during the period May 28 to May 31. Meetings have been held with the Executive of the Ontario Public Health Association and convention committees are being developed. In 1963, the Manitoba Public Health Association will play hosts and the meeting will be held in Winnipeg at approximately the same time of year. Negotiations should be sufficiently advanced to report on details as to the date and site by the time of the Executive Council meeting in June.

The Association owes a great debt of gratitude to its President, Dr. F. B. Roth, the Deputy Minister of Health of the province of Saskatchewan. Dr. Roth has served the Executive Council for many years and has painstakingly and unreservedly served as a member of committees. Special mention must be made of his work as Chairman of the Action Committee previously referred to. Since his assumption of the office of President last June, he has attended almost every meeting of the Executive Committee in Toronto, including those especially called to deal with the appointment of the Executive Director and the development of the Consultant Advisory Service. In consideration of his heavy professional responsibility of which we are well aware, his special sacrifice on behalf of the Association is most sincerely acknowledged.

It is customary to close this report each year with a word of appreciation of my own, and on behalf of the other officers closely in touch with the national office, for the staff who serve so efficiently. Great reliance is placed on them, and the work is carried out accurately and expeditiously. There is no reason why one might not very well open this report with this recognition. We have been fortunate in having a continuance of uninterrupted service, and there has been no change in the assignments carried out by the three members. Mrs. Cynthia Palmer, B.A. acts as editorial assistant and assistant secretary. Mrs. Ruth Wolkoff carries most of the stenography and bookkeeping and the clerical activity of the sanitary inspectors' correspondence course. Mrs. Olive Munro assists with the *Journal*, membership and subscription rolls, Laboratory Section programming and other special assignments.

REPORT OF THE EXECUTIVE DIRECTOR

E. J. Young, M.D., D.P.H.

ON OCTOBER 3, 1960, the Executive Director commenced his duties as the full-time executive officer of the Association. His task was facilitated by the assistance, freely given, of the officers and members of the Association, particularly the President, the Honorary Secretary, Honorary Treasurer and the Editor. The reactivation of the office of executive director is the result of one of the recommendations of the Committee on the Needs of the Association and the Action Committee. It is the aim of the new officer to do everything possible to implement the other recommendations of these committees and to carry out directions received from the Executive Council and the Executive Committee.

Amongst the main responsibilities assigned to the executive director are the establishment and administration of a Consultant Advisory Service in Public Health Administration and the strengthening of the bonds between the Canadian Public Health Association and its provincial and regional branches, divisions and affiliated associations.

With regard to the Consultant Advisory Service in Public Health Administration, the executive director had the opportunity of discussing the new service with the Dominion Council of Health at their meeting in October 1960. He has also been privileged to visit, with two exceptions, provincial departments of health and been able to discuss association business with the deputy ministers of health and their staffs. Several city health departments have also been visited. Visits have been made to the American Public Health Association and the Department of National Health and Welfare for the purpose of discussing with officers of these organizations their experience in the provision of consultant advisory services. The executive director was also given an opportunity to speak to the general sessions at the annual meetings of the Alberta Division and Ontario Public Health Association. A short descriptive leaflet on the new service has been published and distributed and generous allotment of space on this subject has been provided in the Journal.

Up to the time of writing this report in the latter part of April three requests for information regarding the service have been received and two of these were under study. In each case the executive director visited the health department requesting the study in order to ascertain the reason for the request, the requirements of the study and to decide if it would be a suitable project for the Association. Following these visits, the matter was discussed with an advisory committee which has been set up to assist the executive director in this work. An estimate of the cost of the study was made and sent to the health department concerned. If the health departments decide that they wish to have a study done, a consultant or consultants will be selected and asked to undertake the work. It would appear that the Consultant Advisory Service will fill an unmet need in public health in Canada.

In order to increase the liaison between the national association and its branches and affiliated associations, the executive director has visited all the

provinces and has met officers of all the branches. He has participated in the annual meetings of the Alberta Division and the Ontario Public Health Association and in most of the provinces, has attended executive meetings. It is felt that these meetings have provided an opportunity for an exchange of ideas as to how the Association can assist regional and provincial associations and how they in turn can support the work of the national organization.

The executive director attended the annual December meeting of the Laboratory Section and has participated in the work of the Association's committees, particularly those in the areas of membership, sustaining membership, recruitment and the certification of sanitary inspectors. He has also attended and participated in the meetings of the executive committee, the Advisory Editorial Board and has been concerned, with the Honorary Treasurer, with the financial affairs of the Association.

Another of the executive director's responsibilities is the day-to-day administration of the national office. Even before his arrival the accommodation in the Association's central office was overcrowded and the greater activity of the Association is putting further strain on this accommodation so generously provided without charge by the Director of the School of Hygiene. The office staff were already fully employed with monthly preparation of the Journal, the sanitary inspectors' correspondence course, the correspondence of the honorary secretary, honorary treasurer and the editor and other miscellaneous duties so that the additional clerical work necessitated by the appointment of a full-time officer has placed an additional burden on the staff which has been cheerfully borne. However, as the work of the Association increases, if it is to be done promptly and efficiently, it will probably be necessary to secure additional office accommodation and staff.

In conclusion, the executive director, during his first seven months in office, has found the work interesting and challenging. Whilst the Association has a long and proud record of achievement in the field of public health, the recommendations of the Needs of the Association Committee indicate areas where the Association can satisfy unmet needs in Public Health in Canada and increase its stature as a voluntary professional association. The Association's aims, as set out in its new charter, are namely, "The objects of the Association shall be the development and diffusion throughout Canada of the knowledge of public health and preventive medicine and all other matters and things appertaining thereto, or connected therewith." The Association thus has a very broad mandate and doubtless from time to time additional unmet needs in Public Health in Canada will become apparent. These will present the Association with additional challenges and opportunities. As mentioned by the Honorary Secretary, a full time executive officer should be able to do a great deal to further the work of the Association, but the continued dedicated services of the elected officers and the members of the Association are required if the Association is to reach and maintain its rightful place as the senior voluntary health organization in Canada.

REPORT OF THE HONORARY TREASURER

William Mosley, M.D., C.M., D.P.H.

THE HONORARY TREASURER is pleased to report that through the generosity of the federal and provincial governments, funds have been made available to enable the Association to undertake new projects. As a result it has been possible to obtain the services of a full-time executive director and to provide for a Consultant Advisory Service in Public Health Administration to provincial and local health departments. The details of the finances will be found in the accompanying financial statement.

Another encouraging development has been that the interest in and support of the Association by business organizations has increased. During 1960 the four companies listed below renewed their sustaining memberships.

Canadian Industries Limited
Goodyear Tire and Rubber Company
Hudson's Bay Company
International Nickel Company

Early in 1961, the T. Eaton Company again contributed \$200.00 towards the work of the Association, and the Bank of Montreal, the Royal Bank of Canada, the Toronto-Dominion Bank, and the Bank of Nova Scotia enrolled as sustaining members. Only the first four contributions of sustaining members were received in 1960 and appear in the 1960 financial statement.

Revenue from individual memberships has been increased from \$7,072.75 in 1959 to \$8,492.00. Income from advertising in the Canadian Journal of Public Health increased slightly from \$9,197.05 in 1959 to \$9,783.23 in 1960.

It should be noted that the increased revenue from memberships, advertising and other activities of the Association does not compensate for the increased operating costs. Expenditures in 1960 exceed those in 1959 by \$6,478.18 and had it not been for the substantially increased amounts received from governmental sources for services rendered by the Association and for the new Consultant Advisory Service and for the financial support received from sustaining members, the Association would have shown an operating deficit.

During 1960 it was possible to implement recommendations of the Action Committee in the appointment of an executive director and the setting up towards the end of the year of a Consultant Advisory Service in Public Health Administration. It will be noted that the total revenue for 1960 was approximately \$11,000.00 more than in 1959 and the operating expenses were approximately \$6,500.00 more. Net excess of revenue over expenditure was \$9,831.18.

It should be noted that the surplus of \$38,318.63 shown in statement 2 of the auditor's report is the total reserve of the Association accumulated through the years and that the operating surplus for 1960 was \$9,831.18. Whilst the financial statement is encouraging, it is emphasized that expenditures in 1961 will be much greater than in 1960. The special provision of approximately \$10,000.00 towards the costs of additional services will not completely pay these costs and the balance must come from general operating revenue.

In operating the Consultant Advisory Service, it is anticipated that it will

be necessary for the Association to make advances of funds to consultants and others and this will necessitate having funds available for this purpose. This money may have to be obtained from reserve funds.

In addition to the cost of operating the Consultant Advisory Service, additional administrative expenditures must be considered if any of the further recommendations of the Action Committee are to be implemented, and additional revenue will be required if we are to avoid operating deficits.

In order to carry out the additional clerical work resulting from the appointment of an executive director and the development of the Consultant Advisory Service, it is becoming apparent that additional assistance will be required thus increasing the operating costs. The greater activity of the Association is making it more difficult for the central office to operate in the accommodation so generously provided without charge by the Director of the School of Hygiene of the University of Toronto. The offices are already overcrowded and if the staff is enlarged, it may be necessary to obtain more office space which will entail additional expenses for rent.

The Executive Council agreed at the 1960 meeting that some money should be made available to provide for a part-time assistant to the editor and whilst this expenditure was not made in 1960 this will probably be required in 1961.

In conclusion, it is felt that the Association's financial statement is encouraging. It has been possible through the generosity of the federal and provincial governments, a larger membership, free office accommodation and continued support from business organizations to improve our financial position and to embark on an enlarged program. However, in order to retain the modest reserves developed over the years and to meet the expenses of new projects, additional revenues are required.

AUDITORS' REPORT

We have examined the balance sheet of the Canadian Public Health Association as at 31st December, 1960 and the related statements of revenue and surplus for the year ended on that date. Our examination included a general review of the accounting procedures and such tests of accounting records and other supporting evidence as we considered necessary in the circumstances.

In our opinion the accompanying balance sheet and statements of revenue and expenditure and surplus present fairly the financial position of the Association as at 31st December, 1960 and the results of its operations for the year ended on that date in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

TESKEY, PETRIE & BURNSIDE,
Chartered Accountants.

TORONTO, Ontario,
13th March, 1961.

STATEMENT 1

**CANADIAN PUBLIC HEALTH ASSOCIATION
BALANCE SHEET
AS AT 31ST DECEMBER, 1960
ASSETS**

	1960	1959
CURRENT ASSETS		
Cash on hand.....	\$ 35.00	\$ 30.00
Cash in bank—Current.....	3,696.03	6,915.47
—Savings.....	24,354.70	16,020.34
Accounts Receivable <i>less</i> Allowance for Bad Debts.....	4,928.33	2,147.03
Prepaid Expenses.....	344.89	878.20
Accrued Revenue.....	606.97	—
British Columbia Public Health Advance.....	100.00	100.00
Deposit with Postmaster.....	25.00	25.00
	<u>\$34,090.92</u>	<u>\$26,116.04</u>
Investments—Province of Ontario Bonds 4%—1961—Cost....	\$ 5,000.00	\$ 5,000.00
Canadian Journal of Public Health.....	1,000.00	1,000.00
FIXED ASSETS		
Office Equipment—Cost.....	\$ 3,163.09	\$ 3,155.03
<i>Less: Accumulated Depreciation</i>	2,252.64	2,025.03
	<u>\$ 910.45</u>	<u>\$ 1,130.00</u>
	<u>\$41,001.37</u>	<u>\$33,246.04</u>

LIABILITIES

CURRENT LIABILITIES		
Accounts Payable.....	\$ 1,919.74	\$ 4,314.59
Prepaid Subscriptions and Memberships.....	763.00	444.00
	<u>\$ 2,682.74</u>	<u>\$ 4,758.59</u>
Surplus—Statement 2.....	38,318.63	28,487.45
	<u>\$41,001.37</u>	<u>\$33,246.04</u>

This is the balance sheet referred to in our report dated March 13th, 1961.

TESKEY, PETRIE & BURNSIDE,
Chartered Accountants

STATEMENT 2

**CANADIAN PUBLIC HEALTH ASSOCIATION
SURPLUS ACCOUNT
FOR THE YEAR ENDED 31ST DECEMBER, 1960**

	1960	1959
Surplus at 31st December.....	\$28,487.45	\$23,217.91
<i>Add</i>		
Excess of Revenue over Expenditure for the year—Statement 3	9,831.18	5,269.54
Surplus 31st December.....	<u>\$38,318.63</u>	<u>\$28,487.45</u>

**CANADIAN PUBLIC HEALTH ASSOCIATION
REVENUE AND EXPENDITURE ACCOUNT
FOR THE YEAR ENDED 31ST DECEMBER, 1960**

REVENUE

	1960	1959
Advertising.....	\$ 9,783.25	\$ 9,197.05
Subscriptions—less Refunds.....	3,943.81	3,997.61
Membership.....	8,492.00	7,072.75
Sustaining Members.....	800.00	1,400.00
Fees for Services Rendered:		
Dominion of Canada.....	7,500.00	7,500.00
Province of Ontario.....	5,000.00	2,500.00
Province of Quebec.....	2,400.00	2,400.00
Province of British Columbia.....	1,000.00	1,000.00
Province of New Brunswick.....	1,200.00	1,200.00
Province of Manitoba.....	1,000.00	700.00
Province of Saskatchewan.....	1,500.00	1,500.00
Province of Nova Scotia.....	1,200.00	1,200.00
Province of Prince Edward Island.....	200.00	200.00
Province of Newfoundland.....	200.00	200.00
Alberta Division—C.P.H.A.....	1,000.00	500.00
Consultant Advisory Service.....	4,309.51	—
Annual Meeting.....	825.30	477.59
Laboratory Section.....	1,998.32	1,345.55
Sanitary Inspectors'—Examinations.....	815.00	595.00
—Manuals.....	214.00	56.00
—Correspondence Course.....	925.00	456.00
Reprints.....	972.25	989.57
Interest on Investments.....	200.00	200.00
Interest on Savings Bank Account.....	524.85	276.35
	<u>\$56,003.29</u>	<u>\$44,963.47</u>

EXPENDITURE

Printing.....	\$23,322.47	\$21,863.98
Postage on Magazines and Mailing Cost.....	752.15	787.03
Honoraria.....	150.00	120.00
Salaries.....	12,866.92	9,293.77
Travelling.....	792.60	53.92
Stationery and Office Supplies.....	539.14	361.91
Postage, Telephone and Express.....	706.22	643.55
Unemployment Insurance.....	128.78	83.63
Pension.....	125.06	—
Commissions Paid.....	902.00	920.26
Annual Meeting.....	985.74	1,638.53
Laboratory Section.....	1,619.10	766.60
Sanitary Inspectors'—Examinations.....	287.30	173.21
—Manuals.....	66.65	129.35
—Correspondence Course.....	441.26	34.35
Reprints.....	1,149.41	970.44
Federal and Provincial Health Service.....	171.75	545.79
Salary Survey.....	5.64	51.69
Committee on Membership.....	58.94	65.09
Miscellaneous Expenses.....	648.92	862.48
Provision for Depreciation—Office Furniture and Equipment.....	227.61	65.00
Bad Debts Written Off.....	—	8.50
Discounts and Exchange.....	224.45	254.85
	<u>\$46,172.11</u>	<u>\$39,693.93</u>
Excess of Revenue over Expenditure.....	<u>\$ 9,831.18</u>	<u>\$ 5,269.54</u>

Association News

As announced in past issues of the Journal, one of the purposes in appointing a full-time executive officer was to increase liaison between the Association and its branches and for the C.P.H.A. to give as much assistance as possible to the provincial associations. During April the Executive Director, Dr. E. J. Young, completed a trans-Canada tour, visiting Alberta, British Columbia, Saskatchewan, Manitoba and Quebec.

In Alberta he was able to attend a meeting of the outgoing executive which preceded the annual meeting of the Alberta Division and was also privileged to be present and participate in the proceedings of the annual meeting. Unfortunately, it was not possible for him to attend the annual meeting of the British Columbia Branch of the Association as this occurred at the same time as the Alberta Division meeting. A meeting of the British Columbia Branch executive was arranged during his visit to Vancouver which gave Dr. Young an opportunity to meet the members of the executive and to participate in the meeting. In Regina he attended a meeting of the committee planning the annual meeting of the Canadian Public Health Association and the Saskatchewan Branch. In Manitoba a meeting of the executive of the Manitoba Public Health Association was held during Dr. Young's visit. Later in the month the Executive Director attended a meeting in Montreal of La Société d'Hygiène et de Médecine Préventive de la Province de Québec.

British Columbia Branch

During "Institute" week in Victoria, the British Columbia Branch of the C.P.H.A. held its seventh annual meeting. Election of officers resulted in the following being elected by acclamation: President, Dr. M. McLean; Vice-President, Miss F. M. Ross; 2nd Vice-President, Dr. J. Smith; Secretary, Mr. A. Dobson, all of the Greater Vancouver Metropolitan Health Committee; Treasurer, Mr. D. A. Geekie, B.C. Tuberculosis Society; Members, Dr. C. J. G. MacKenzie, Nanaimo; Mr. R. H. Goodacre, Victoria; Miss A. Stephenson, Langley; Mr. M. Ewan, New Westminster and Miss A. Cummings of the V.O.N., Vancouver.

Alberta Division

The annual convention of the Alberta Division was held at the Beacon Hotel, Cal-

gary, April 5-7, under the presidency of Mr. E. J. Kibblewhite. The Division was happy to welcome Dr. E. J. Young on his first official visit to the Province since his appointment as Executive Director, and to hear two addresses from him. Other guest speakers included Dr. Irial Gogan, Medical Superintendent of the Holy Cross Hospital in Calgary, Dr. J. S. Gardner, Chief of Surgery at the Colonel Belcher Hospital in Calgary, and Dr. Margaret Thompson, Assistant Professor of Human Genetics at the University of Alberta.

The following were elected as officers of the Division for 1961-62: Dr. H. M. Brown as President, Dr. W. A. Zacherl as Vice-President, Dr. K. Adler as Secretary, Miss Anne MacKenzie as Treasurer, Dr. K. A. Barrett as Chairman of the Medical Officers' Section, Dr. E. D. Erickson as Chairman of the Dental Officers' Section, Miss Elizabeth Stucker as Chairman of the Nurses' Section and Mr. N. Bruce as Chairman of the Sanitary Inspectors' Section. The election of a chairman for the Occupational Health Workers' Section was deferred, and it was left to the new executive to appoint a chairman of the Membership Committee.

Manitoba Public Health Association

A varied and interesting program featured the spring meeting of the Manitoba Public Health Association, held during April. More than 80 members and guests were registered for the sessions, chaired by President J. Courteau. Dr. M. R. Elliott, Deputy Minister of Health, introduced the guest speaker, Dr. F. B. Roth, Deputy Minister of Health for Saskatchewan, and President of the C.P.H.A.

During the afternoon session, the following speakers took part: Miss P. Desjardins, Executive Director of the Canadian Mental Health Association, Manitoba Branch; Dr. Ralph Connor, Director of the Bureau of Dental Services, who presented a report on the fluoridation survey in Brandon; and Dr. J. B. Morison, who spoke on the relationship of smoking and lung cancer.

Nova Scotia Branch

At a recent executive meeting of the Nova Scotia Branch plans were made to hold the annual meeting in Sydney at the Isle Royale Hotel on September 27 and 28. A full executive meeting of the branch was held on May 3 in Sydney at which time plans for the annual meeting were completed.

News Notes

International

A conference of plenipotentiaries from 77 nations convened recently in New York and adopted a convention which provides for controls over addiction-producing narcotics and over the raw materials of which such narcotics are made, including the opium poppy, the cannabis (marijuana) plant and the cocoa (cocaine) bush. An international control board of 11 members is to be elected in three-year terms by the U.N. Economic and Social Council. Mr. R. E. Curran, Legal Adviser to the Department of National Health and Welfare, was chairman of the Drafting Committee.

Federal

An agreement has now been reached whereby the Directorate of Indian and Northern Health Services of the Department of National Health and Welfare will act as the nucleus of a Health Department for the Northwest Territories. Dr. John Willis has been designated General Superintendent of the Northern Health Services.

The Canadian Psychiatric Association opened a national office in Ottawa recently at Suite 103, 225 Lisgar Street.

Two courses for nurses were held at the Civil Defence College in Arnprior during May 1961. From May 1-5 a course for nurse educators was held. During the week commencing May 29 a course was held for nurse specialists (public health and industrial nurses).

The Indian and Northern Health Services Directorate of the Department of National Health and Welfare regrets to report the death of Dr. H. T. J. Nylander of the staff of the Charles Cammell Hospital, Edmonton. Dr. Nylander died on February 17, 1961.

British Columbia

A one-day institute, sponsored and arranged by the Obstetrical Nurses' Study Group of Greater Vancouver and New Westminster, took place in Vancouver, March 23, with 80 nurses attending. Chief subjects of discussion were obstetrics, including pre-natal exercises, and mental health. The speakers included: Dr. A. A. Cashmore, of the Children's Clinic, Mental Health Centre, Burnaby; Miss M. Duncan, associate professor at the School of Nursing,

University of British Columbia; Dr. K. G. Nickerson, obstetrician, of Vancouver; Mrs. Barbara West, physiotherapist and Miss M. Brown, supervising nurse at North Vancouver's Lions Gate Hospital.

The British Columbia Annual Public Health Institute was held again this year at Victoria, April 4-7. Guest speakers were Dr. W. S. Barclay, Indian Health Services; Miss Christine Charter, V.O.N.; Dr. S. R. Laycock, former Dean of Education at University of Saskatchewan; Dr. J. F. McCreary, Dean, Faculty of Medicine and Dr. D. H. Williams, Professor and Head of the Department of Continuing Medical Education, University of British Columbia and Mr. J. H. Ross, consulting electrical engineer. The main theme of the Institute was Rehabilitation; on each day, one or more participants spoke on selected aspects of this subject, and were followed by Dr. G. F. Amyot, Deputy Minister of Health, in a review of the topics discussed. The annual Public Health Staff dinner, held in the Empress Hotel ballroom, was again highlighted by a special occasion; this time it was a little ceremony, marking the last Public Health Institute over which Dr. Amyot would preside, in view of his impending retirement at the end of the year. It would also be the last occasion on which he would meet all members of the Staff together. On behalf of all members of the Provincial Health Branch, Dr. J. A. Taylor, Deputy Provincial Health Officer, presented to Dr. Amyot a framed illuminated scroll.

Staff Changes

Dr. K. I. G. Benson, for the past three years director of the Cariboo Health Unit at Prince George, has been appointed Director of the Division of Health Units in Victoria. He took his new position early in May.

Dr. F. M. Brunton, regional dental consultant for the Vancouver Island Health Units, has resigned his appointment.

Dr. Donald Black has resigned as director of the South Central Health Unit at Kamloops. He has accepted the appointment as director of the North Shore Health Unit of the Greater Vancouver Metropolitan Health Committee, succeeding Dr. George A. Mott.

Alberta

Under the sponsorship of the Provincial Department of Public Health, and with the Measures Organization and the St. John Ambulance, a first aid instructors' course was held in Edmonton, April 4-5, and was attended by sixteen municipal nurses and by nursing representatives from the Provincial Department of Public Welfare, the City of Edmonton Health Department and the Victorian Order of Nurses.

Dr. R. B. Murray of Montreal has been appointed as Medical Officer of Health of the Minburn-Vermilion Health Unit.

Miss Mary Black, Senior Nurse of the Vegreville Health Unit, retired on June 1. Miss Black has served in the Vegreville area, first with the School Health Service and subsequently with the Health Unit Service, for nearly forty years.

Miss Black's successor in the Vegreville Health unit is Miss Angeline Worshek. Other recent appointments include Miss Jeanette Zaharko as Senior Nurse of the North Eastern Alberta Health Unit and Mrs. Katherine Baker as Senior Nurse of the Forest Lawn Health Unit.

Saskatchewan

Initiated by the Department of Public Health in 1954, *Child Safety Day* was observed for the eighth consecutive year on Sunday, May 7. The purpose of the day is to focus attention on a tragic problem, cause wider awareness, and stimulate preventive measures.

A large group of employees of the Departments of Public Health and Social Welfare have joined in *preretirement meetings* being conducted monthly under chairmanship of Christian Smith, director of health education.

North Battleford business men were enthusiastic in their response to a recent series of coffee breaks sponsored by the North Battleford Health Region. The program, organized by Dr. Elizabeth Ives, assistant medical health officer, consisted of discussions on *heart disease and its relationship to diet and physical fitness*.

Prince Albert's polio immunization project with oral vaccine—the first community-wide use in Canada—had a tremendously successful public response. Approximately 94.5% of the city's population, estimated at approximately 23,000, took advantage of the program in a period of 8 days, the ma-

jority of them in the first 3 days—February 27, 28 and 29.

An important new step has been taken in Saskatchewan's pioneering *rheumatic fever control program* with the appointment of a joint committee of the Department of Public Health and the College of Physicians and Surgeons of Saskatchewan. The group is made up of physicians who also represent a number of community organizations.

Terms of reference for the committee are: 1. A method of uniform reporting of new cases. 2. Recommended procedures for regional prophylaxis committees in reviewing new cases. 3. Follow-up procedures which would lead to the most effective use of the program. 4. Uniform statistical data dealing especially with continuity of coverage, incidence of recurrent attacks and end results. 5. Development of consultative services with one geographic area and another and between these areas to advise on problem cases of greater than average complexity. 6. Encouraging clinical and epidemiological research about rheumatic fever.

Mary P. Edwards, B. N. (McGill), Reg. N., director of public health nursing, retired April 30. Miss Edwards joined the Department of Public Health in 1942 and served successively as staff nurse, supervising nurse, and finally director of nursing services.

Dr. Abram Krahn has joined the Department of Public Health as an assistant medical health officer. He is presently engaged in an orientation course with the department before entering the School of Hygiene, University of Toronto, this fall.

Dr. Louis S. Skoll, until recently medical health officer at Pietersburg, Northern Transvaal, has joined the Department of Public Health as medical health officer of the Yorkton-Melville Health Region.

Manitoba

An extensive publicity campaign featuring *Child Safety Day*, May 7, was undertaken by the Bureau of Health Education, with all mass media being utilized.

W. Ward, Chief Chemist with the Environmental Health Laboratory, during April attended the American Conference of Governmental Hygienists, in Detroit.

Dr. E. Snell, Director of V.D. Control, has been appointed a member of the Com-

mittee of Industrial Medicine of the Manitoba Medical Association.

Plans have now been completed for an accident survey to be conducted in four areas of Manitoba, in order to gain an insight into the magnitude of the problem in this province, and to acquire provincial statistics. In two of the areas, the survey will be under the direction of the agricultural representatives, while in the other two, the health unit staff will undertake the task of appointing reporters, and obtaining accident statistics.

Ontario

In October 1960 the Medical Officer of Health of the City of Toronto, Dr. A. R. J. Boyd, received approval from the local board to increase the establishment of its Mental Health Division and to amend the establishment of the Department of Public Health to provide eight mental health nurses, one for each of the eight health districts.

Quebec

Dr. Ad. Groulx, M.P.H., Director of Health of the City of Montreal in his annual report published in the City's health bulletin states that the general health of the population of Montreal is quite satisfactory. The most outstanding feature of the vital statistics for the year 1960 is the reduction of the infant mortality rate from 27 to 23.1 per 1,000 live births.

The report records a regression of acute communicable diseases especially those of an epidemic nature with the exception of two small outbreaks, one caused by an unusual incidence of cases of trichinosis and the other by the onset of 22 cases of typhoid fever during the month of February.

New Brunswick

Construction of a 169-bed addition to the Provincial (Mental) Hospital at Campbellton, N.B., at a cost of about \$1 million is due to start in June. This will increase the rated bed capacity of the institution to 779. The first phase of construction of this hospital operated by the Department of Health was completed in 1954. The original bed capacity of 225 has since risen to 610 with completion of the second and third phases. The new addition about to be built will complete the building program at the institution.

The attention of New Brunswick parents is being directed to the need for sufficient Vitamin C in the daily diet of children, in the light of statistics showing that 88 cases of scurvy—caused by lack of Vitamin C—were treated at hospitals in the province in 1960.

Dr. Vincent Gendron has resigned as district medical health officer for the counties of Restigouche and Gloucester in northern New Brunswick. He was appointed to that position in 1955. He is now with the Department of Health of the Province of Quebec and is now located at St. Anne de la Pocatière, Kamouraska Co., Que.

Dr. Etienne Duguay has succeeded Dr. Gendron as acting district medical health officer for Restigouche-Gloucester and will combine these duties with his regular functions as regional tuberculosis consultant.

Nova Scotia

Miss Diane Bethune, a home economics graduate of Mount Allison University has joined the staff of Nutrition Division. Miss Bethune has a Diploma in Dietetics from the Victoria General Hospital. Her headquarters will be in Fundy Health Unit.

A conference on nutrition education was recently held in Halifax. One hundred and fifty people were in attendance from the four Atlantic Provinces. Those taking part were dietitians, home economics teachers, agriculture extension workers, nutritionists, physicians, nurses, representatives from advertising, art, press, radio, and television.

The Third Maritime Workshop on Rehabilitation was held at Shediac, New Brunswick, May 24, 25, 26.

The annual Staff Meeting of the Provincial Department of Public Health was held in Halifax on April 17, 18, and 19. On April 19, the Staff visited the Nova Scotia Hospital and toured the new hospital and parts of the old hospital which are being renovated. In the afternoon they visited the new Provincial Pathological Laboratory on University Avenue. During this visit, Dr. C. E. vanRooyen briefly outlined the oral polio vaccine which is currently being administered in the Western Health Unit.

On April 20, the Provincial Public Health Nursing Supervisors met for the day to discuss the work of the Nursing Divisions in each health unit, as well as making tentative plans for the annual Staff Meeting to be held in Sydney on September 25 and 26.

Books and Reports

RESPIRATION. Physiologic Principles and Their Clinical Applications. P. H. Rossier, A. A. Bühlmann, K. Wiesinger. Edited and translated from German by Peter C. Luchsinger, M.D. and Kenneth M. Moser, M.D. C. V. Mosby Co., St. Louis, Mo., U.S.A. 1960, 505 pp., \$15.75.

This book is a translation from the second edition in the German language, originally published in 1958. It has been extensively revised and rewritten in keeping with the goal of making all sections understandable and readable to the American audience. The translators have substituted their own points of view on the original controversial interpretations and opinions in some instances, whilst retaining them in others.

The book is divided into four parts: Normal Physiology of Respiration, Investigative Methods in Pulmonary Function, Pathophysiology of Respiration, and Pulmonary Insufficiency in Clinical Practice. It contains a great deal of information for the clinical cardiorespiratory physiologist and represents to a large extent the views held by the Zurich School. The illustrations contained in the text are good and the index is adequate. The extensive bibliography represents a selection of the more important contributions to the field of cardiorespiratory physiology and is arranged in general fields in order to facilitate the finding of specific papers. In recent years great advances have been made in the field of respiratory physiology and both the authors and the translators are to be congratulated on their presentation of the available material and their conjoined efforts provide a useful basis for future study.

RADIATION INJURY IN MAN: Its Chemical and Biological Basis. Pathogenesis and Therapy. Eugene P. Cronkite, M.D. and Victor P. Bond, M.D., Ph.D. Ryerson Press, 299 Queen Street West, Toronto 2B. 1960, 200 pp., \$7.25.

The necessity of living with atomic energy and ionizing radiations is becoming increasingly evident and one can no longer remain aloof from the problems involved. This book presents in a non-technical language and in a readable form the basic and practical material necessary for an understanding of the effects of ionizing radiation in man. The book is well suited to the needs of the

Medical Officer of Health and to the General Practitioner whose work brings him into contact with problems of ionizing radiation. It is also suitable for medical and dental students and for others without any special training in radiation physics.

The opening chapters deal with the basic physics of radiation, with its assessment and detection and are followed by a discussion of the physiological and pathological effects of radiation in the mammal. The clinical picture of acute irradiation and the problems of the treatment and management of the acute radiation syndrome are discussed at length in succeeding chapters. The final chapter deals with the effects of low-level exposure to radiations including fallout. The information contained in this book is well supported by an adequate glossary of over 125 terms and phrases along with a useful bibliography.

RADIOACTIVE WASTES: Their Treatment and Disposal. General Editor, John C. Collins. E. & F. Spon, Ltd., 22 Henrietta Street, Strand, W.C.2, London, England. 1960, 239 pp., 55s.

The publication of this book comes at a time when there is a great expansion in the use of radioactive materials for a variety of purposes. The final disposal of this material poses many problems for the engineer, the chemist and for those whose prime responsibility is for the general health of the population.

The structure of the book is that it is a symposium by a number of people who have had wide practical experience and are authorities in their own fields. The first half of the book is of a fundamental nature explaining the problems which need to be understood when dealing with radioactive material. The second half deals specifically with the treatment and disposal of liquid, solid and gaseous radioactive wastes and it includes valuable information on the results of laboratory work, and on the experience gained in operating treatment plants in different parts of the world. The production of the book is excellent and the text is amply illustrated with line drawings where these are needed to clarify a particular point. Each chapter contains a well documented list of references and a useful glossary of terms is provided at the end of the book.

HEALTH AND VITAL STATISTICS FOR THE UNITED STATES. *U.S. Department of Health, Education and Welfare. Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. 1960, 31 pp., 25¢.*

This publication presents a summary which answers the questions most often asked in reference to health and vital statistics for the United States. It relates to the year 1959. In addition to births, deaths, and marriages, it includes reported cases of communicable diseases, poliomyelitis vaccination status of the civilian population under 60 years, and selected chronic conditions. It is a publication which will be appreciated by health workers in Canada as a convenient source of information.

MEDICAL HELMINTHOLOGY. *J. M. Watson, D.Sc. (Lond.), A.R.C.S. The Macmillan Co. of Canada Ltd., Toronto. 1960, 487 pp., \$14.25.*

The author, from a rich experience as teacher and investigator, has presented concisely the basic facts regarding the helminths parasitic in man and diseases caused by them. He has also indicated the more important gaps in our knowledge as a stimulus to research. Emphasis has been laid primarily on the practical, medical aspects of helminthic infections and special attention has been paid to the fundamental zoological knowledge on which these have been based. There are 62 figures, the majority of which are drawings from actual specimens.

TEXTBOOK FOR HEALTH VISITORS. *L. Roberts and B. D. Corner. Macmillan Co. of Canada, Toronto, Ont. 1960, 505 pp., \$5.50.*

This book is a triumph of condensation, requiring much concentration for comprehension. Legislation discussed, is of course, that of the United Kingdom. One can but touch on certain items mentioned in the text. The section on breast feeding is good and in keeping with modern trends towards less rigidity of schedules. Public health nurses could with advantage read the section on expression of breast milk. The dangers of excessive dosage with vitamin D are mentioned. The views on toilet training appear to be a trifle optimistic. This book would be useful for Canadian public health nurses.

THE TEACHING OF THE BASIC MEDICAL SCIENCES IN THE LIGHT OF MODERN MEDICINE. *Eighth Report of the Expert Committee on Professional and Technical Education of Medical and Auxiliary Personnel. World Health Organization: Technical Report Series. Available through the Queen's Printer, Ottawa. 1961, No. 209, 31 pp. 30¢.*

This brief report embodies general recommendations for improving the teaching of basic and preclinical sciences to medical students.

Repeated emphasis is placed on the desirability of stressing the preventive aspects of medicine in the teaching of the preclinical sciences. Emphasis is also placed on the need to replace traditional material that is no longer useful with material on recent scientific advances that have important clinical applications.

SCHOOL HEALTH AND HEALTH EDUCATION. *C. E. Turner, C. M. Sellery, S. L. Smith. C. V. Mosby Co., St. Louis, Mo., U.S.A. Fourth Edition 1961, 481 pp., \$5.00.*

This book is written for teachers, and all those interested in the health of school children. The organization, methods, and procedures in health education are presented in some detail. The book is well arranged, in twenty chapters, it is good and could be read with advantage by physicians, teachers and public health nurses.

PROCEEDINGS OF THE NATIONAL CONFERENCE ON WATER POLLUTION. *U.S. Department of Health, Education, and Welfare. Public Health Service, Washington 25, D.C. 1961, 607 pp.*

This volume presents the official proceedings of the National Conference on Water Pollution. The material in this volume is presented in eight chapters, the first seven are devoted to individual sessions and the eighth to a summary of recommendations. The main topics discussed are water pollution and our changing times, meeting the growing competition for water, keeping water clean and research and training. The material is based upon the formal presentations of speakers and discussants, supplemented by stenographic transcript of floor and panel discussions.

These proceedings are of value to those who are concerned with water pollution, its present problems and future implications.

CHEMICALS IN FOOD. *Dr. Franklin Bicknell. British Book Service (Canada) Ltd., Toronto, Ont. 1960, 192 pp., \$3.00.*

This book contains a great deal of information on the harmful effects of chemicals in food and in farm produce. Those chemicals, which as a result of present day methods of agriculture, preservation and processing are now present in food, are discussed from the point of view of their long term effects upon health. The author substantiates his statements by reference to the very extensive literature on the subject.

The book contains chapters on the investigation of cancer-causing chemicals, the prevention of dental decay, and on colours, preservatives and agricultural chemicals in food, including antibiotics, drugs, hormones and pesticides as well as many other relevant topics. The last chapter reviews the damage done to wild life by agricultural chemicals and also describes how fish are thereby destroyed in streams and lakes. The 291 references given at the end of the book are a valuable source of information for those who may wish to extend their knowledge of work in this field.

"Chemicals in Food" is of interest and value to those concerned in food hygiene and food technology. Its contents are provocative and are well worthwhile reading.

THE AIR WE BREATHE. A Study of Man and his Environment. *Edited by Seymour M. Farber, M.D. and Roger H. L. Wilson, M.D. Charles C. Thomas, 301 East Lawrence Ave., Springfield, Ill., U.S.A. 1961, 414 pp., \$14.00.*

This book is a record of an international symposium on "The Air we Breathe", recently held at the University of California Medical Center at San Francisco. The subject matter is divided into four sections: The "Normal" Atmosphere and its Variations; The Air Pollution Problem of Industry; Urban Living and Air Pollution, Smog and Fog; and specific problems, such as "The Effect of Dusts on the Human Lung" and "Environment and Cancer". Each section is concluded with a panel discussion on the papers presented in that section.

The symposium covers many disciplines with papers given by physicians, chemists and engineers of international repute. It contains a great deal of useful information on the multi-faceted problems of atmospheric pollution and provides an interesting and illuminating digest of present knowledge on this subject, particularly with reference to

the epidemiology of lung cancer, and at the same time indicating those areas where further research is needed.

This book is of great value to all those whose work or interests bring them into contact with problems of atmospheric pollution. It is well illustrated with photographs and diagrams and contains both name and subject indices.

ELEMENTARY HUMAN PHYSIOLOGY.

Terence A. Rogers, Ph.D. John Wiley and Sons Inc., New York. 1961, 417 pp., \$6.50.

This is an excellent elementary text-book. The writing is clear. The diagrams and drawings are very good. The concept of homeostasis is skilfully used as a unifying theme. This book should serve admirably as an introduction to physiology, especially for those with little previous knowledge of biology and chemistry.

EUROPEAN STANDARDS FOR DRINKING-WATER. *World Health Organization. Available from Queen's Printer, Ottawa. 1961, 52 pp., 60¢.*

An earlier publication by WHO "International Standards for Drinking-Water (1958)", set out the minimum standards of chemical and bacteriological quality that might reasonably be required for public supplies of water for domestic use, and gave detailed descriptions of approved methods of investigation.

This publication contained standards which were generally approved for the world as a whole. In Europe higher standards are in effect and the present publication attempts to unify the methods of investigation and the expression of the results.

The report gives detailed recommendations on the bacteriological, physical and chemical examination of drinking-water supplies. It is pointed out that such standards are by no means mandatory; new techniques in drinking-water purification are constantly being introduced and the increasing presence of industrial pollution may eventually lead to the modification of such standards.

This publication is of value to health authorities who are concerned in seeing that the supplies of water reaching the public are pure and wholesome.

